Clean Marina Initiative

GUIDEBOOK

Prepared by
The Manasquan Watershed Management Group

2001

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Foreword

The Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 require all coastal states to develop Coastal Nonpoint Source Programs to address polluted runoff within the coastal zone. Nonpoint source pollution is the name for the disparate droppings of our society. It is the grease from our cars, fertilizers from our land, and exhaust from our lawn mowers. It also includes stormwater runoff from boatyards, drips from fuel docks, discharges from marine heads, and fish waste from recreational anglers.

In response to CZARA, the State New Jersey submitted a report that describes New Jersey's various laws, regulations, and programs that address nonpoint source pollution. After reviewing the report, the United States Environmental Protection Agency (EPA) and the National Oceanographic and Atmospheric Administration (NOAA) released their findings in 1995. They determined that New Jersey needed to do more to control nonpoint source pollution associated with marinas and boating.

With the release of these findings, New Jersey was faced with the possibility of having to impose additional regulations on marinas. Fortunately, NOAA is currently supporting voluntary programs to reduce marina-based pollution. New Jersey, under this initiative, is proposing to be allowed to pursue a voluntary approach in lieu of imposing new regulations. New Jersey now has to successfully develop and begin implementation of the Clean Marina Initiative. The goal of this initiative is to develop a demonstration program for select marinas and to test its feasibility for statewide application.

New Jersey's marinas have been given an opportunity to avoid regulation by voluntarily adopting pollution prevention practices. We urge all marina operators to embrace the challenge: to work with the Clean Marina Initiative to protect clean water and fresh air.

Acknowledgments

This Clean Marina Guidebook would not have been possible without the leadership of the Maryland Clean Marina Program. Staff at the Maryland Department of Natural Resources exhibited creativity and initiative in developing this voluntary program. The original Clean Marina Guidebook was written by Elizabeth Fuller Valentine with the active participation of the Maryland Clean Marina Committee. Drafts of the Maryland Clean Marina Guidebook were also reviewed by a variety of experts from a host of public and private organizations.

The Maryland Clean Marina Committee members freely volunteered their time and effort to review and discuss the Guidebook. They are a truly knowledgeable and dedicated group. The Maryland Clean Marina Committee, who deserve credit for the creation of this program, are:

Herrington Harbour Marinas
Crockett Brothers Boat Yard
Ocean City Fishing Center
Mears Marina
United States Coast Guard, Activities Baltimore
Maryland Center for Environmental Training, Charles County Community College
Port Annapolis Marina
Maryland Department of the Environment
Haven Harbour Marina
Marine Trades Association of Maryland
University of Maryland Sea Grant Program
Boat/U.S. Clean Water Trust
Sunset Harbor Marina
Point Lookout Marina
Maryland Environmental Service
Watershed Associates
Turkey Point Marina

The Maryland Clean Marina Initiative is staffed by the Waterway Resources Division of the Department of Natural Resources: Jody Roesler, Division Director; Elizabeth Fuller Valentine, Program Coordinator; Donna Morrow; Donald O'Neill; and Rhonda Cormier.

This Guidebook has been revised to reflect New Jersey's laws, regulations, and environmental conditions. This guidebook was revised by Steve Taylor with participation from the following organizations:

The Manasquan Watershed Management Group
Marine Trades of New Jersey
New Jersey Marine Science Consortium
New Jersey Department of Environmental Protection
Rutgers University Sea Grant Program
Coast Guard

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Special Features

Acronyms

BMP	Best Management Practice
CAFRA	Coastal Area Facilities Review Act
CFR	Code of Federal Regulations
COE	U.S. Army Corps of Engineers
EPA	Environmental Protection Agency
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
IDA	Intensely Developed Area
LDA	Limited Development Area
MCDH	Monmouth County Department of Health
MPPRCA	Marine Plastic Pollution Research and Control Act
MSD	Marine Sanitation Device
MTA	Marine Trades Association
MWMG	Manasquan Watershed Management Group
NDA	No Discharge Area
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJMSC	New Jersey Marine Sciences Consortium
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OCDH	Ocean County Department of Health
PWC	Personal Water Craft
QAC	Quarternary Ammonium Compounds
RCA	Resource Conservation Area
RCRA	Resource Conservation and Recovery Act
RFA	Request For Authorization
SAV	Submerged Aquatic Vegetation
TCLP	Toxicity Characteristic Leaching Procedure
UL	Underwriters' Laboratories
UST	Underground Storage Tank
USC	United States Code
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Introduction

The Clean Marina Initiative is an effort to assist marina and boatyard operators to protect the resources that provide their livelihood: clean water and fresh air. These natural assets are essential features of the boating industry. After all, many boaters are drawn to the water by nature's glory. They want to feel the sea rolling beneath them and the crisp air against their skin. They want to see fish running and birds diving. They want to be able to swim and crab without fear of disease. They want to test their mettle against a rising storm and to sit tranquilly at twilight. Ironically, it is the enjoyment of these natural wonders that may lead to their decline.

The maintenance, operation, and storage of recreational vessels has the potential to pollute adjacent waters and to impair air quality. Contaminants include dust from hull maintenance operations, solvents from engine repair shops, petroleum from careless fueling practices, sewage discharges from boats, and heavy metals from antifouling paints. These pollutants may be deposited directly into waterways or they may be carried in by stormwater runoff. Marina design and location may also contribute to environmental degradation by disturbing sensitive habitat areas.

This is not to say that marinas and boaters are the only contributors to environmental degradation. Quite the contrary is true. Water quality is impacted by fertilizers and pesticides applied by land owners (residential, commercial, and agricultural), by industrial discharges, and by our choices of home cleaning products. It is affected by sediment washed from cleared land and by stormwater runoff that collects oil and heavy metals deposited by our cars. Environmental degradation is not the result of any particular industry or user group. It is the consequence of all of our activities. As such, we all have an obligation to do what we can to minimize the negative environmental impacts of our actions. If we each take responsibility for that part of the problem, which we can control even if it seems insignificant, the cumulative result will be a cleaner, healthier environment.

By adopting the best management practices recommended throughout this Guidebook, you will demonstrate your commitment to environmental stewardship. You can be proud that you are doing your share to protect the natural resources upon which we all depend. Additionally, your marina or boatyard will be a safer, healthier place to work. You may be able to save money by reducing your costs for materials and for waste cleanup and disposal. You may increase your income by renting out equipment such as vacuum sanders and by selling recyclable materials such as batteries and office paper. Similarly, cleaner, more efficient equipment will increase your staff's productivity. Your liability associated with waste handling may also be reduced. And, your facility will be more attractive to those who care about the health of our water, land, and air.

The Clean Marina Initiative seeks to promote clean water and fresh air by providing technical advice and educational material to marina operators and boaters. The goal is to encourage informed decision-making that leads to a reduction in boating-related pollution. The Clean Marina Guidebook provides an overview of actions that marine industry professionals can take to protect water and air quality. It is written for managers of full service marinas with boatyards. The recommendations contained within, however, are equally applicable to marinas with limited services, independent boatyards, and marine contractors. The Guidebook provides advice on the following topics:

- siting considerations for new or expanding marinas
- marina design and maintenance
- stormwater management
- vessel maintenance and repair
- petroleum control
- sewage handling
- waste containment and disposal
- marina management
- laws and regulations

Those marinas that adopt a significant proportion of the best management practices suggested within the Guidebook will be recognized as Clean Marinas. They will receive a certificate acknowledging their environmentally responsible actions, authorization to use the Clean Marina logo on their letterhead and in their advertising, a burgee to fly from their property, and promotion by the Clean Marina Initiative in publications, on the world wide web, and at public events.

The Clean Marina Initiative will be an honor system in that marinas will report themselves as "ready" as having adopted BMP's. It will be important to emphasize strongly that "Visitor Teams" will consist of 3 marina owner members (volunteers) of Marine Trades Association and there will no be any reports rendered to any outside agencies; reports may be rendered to the marina inspected if it is felt by the team that such would be of value to the marina visited.

Now is the time to take a leadership role in protecting and enhancing the quality of our natural resources. Please, do your part.

How to Use this Guidebook

The Clean Marina Guidebook is intended to be used as a reference document. Refer to selected chapters as needed. For example, as you prepare for spring commissioning, review the recommendations in the Vessel Maintenance and Repair chapter.

As you read through the Guidebook you will find that recommendations are preceded by a scale (γ), a thumbs-up (👍), or a checkmark (✓). The scale identifies legal requirements, a thumbs-up precedes highly recommended practices, and a checkmark indicates desirable activities.

Helpful Hint

As you read through the Guidebook you will find that recommendations are preceded by a legal scale (γ), a thumbs-up (👍), or a checkmark (✓). Scales identify legal requirements, thumbs-up precede highly recommended practices, and a checkmark indicate desirable activities.

Four Clean Boating Tip Sheets are included in the Guidebook. They address vessel cleaning and maintenance, petroleum control, vessel sewage, and waste containment and disposal. These tip sheets are meant to be photocopied and distributed to boaters. There is space on each sheet to include your marina's name and logo.

Throughout the book you will find references to additional sources of information. Contact information and brief descriptions of services offered by each authority are listed in *Appendix I.* Subsequent appendices contain information about permitting assistance, recycling contacts, used oil recycling, sample contract language, and conservation landscaping.

Siting Considerations for New and Expanding Marinas

Environmental Concerns

Legal Setting

- Coastal Area Facility Review Act
- The Waterfront Development Law
- The Wetlands Act of 1970
- United States Army Corps of Engineers

Site Selection Guidelines

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- Characterize Project Site
- Identify Rare and Endangered Species
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- Avoid Critical Migration, Nesting and Spawning Periods
- Avoid Colonial Waterfowl Nesting and Staging Areas
- Avoid Geographic and Hydrographic Impediments
- Consider Bottom Configuration
- Follow Natural Channels

Siting Considerations for New and Expanding Marinas

Environmental Concerns

The natural plant and animal communities of coastal areas serve multiple functions. Wetlands, for example, provide habitat for fish and fowl. They form a natural buffer against incoming storms and act as a filter to purify stormwater runoff from the land. Wetlands also minimize erosion and support tourism, hunting, and fishing. Because of the ecological, economic, recreational, and aesthetic values inherent in coastal resources, it is important that shoreside development not diminish these features.

Legal Setting

CAFRA

The Coastal Area Facility Review Act (CAFRA) applies to projects near coastal waters in the southern part of the State. The CAFRA area begins where the Cheesequake Creek enters Raritan Bay in Old Bridge, Middlesex County. It extends south along the coast around Cape May, and then north along the Delaware Bay ending at the Kilcohook National Wildlife Refuge in Salem County. The inland limit of the CAFRA area follows an irregular line drawn along public roads, railroad tracks, and other features. The CAFRA area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline. The law divides the CAFRA area into pieces or zones, and regulates different types of development in each zone.

The CAFRA law regulates almost all development activities involved in residential, commercial, or industrial development, including construction, relocation, and enlargement of buildings or structures; and all related work, such as excavation, grading, shore protection structures, and site preparation. CAFRA requires specific project designs for new marinas that promote water quality and protect public health.

CAFRA contains exemptions for certain minor activities such as maintenance, plantings, decks or similar structures at a residence, rebuilding a damaged structure on the same building footprint (if it was damaged after 7/19/94), and enlarging a dwelling without increasing its footprint or number of units. Contact NJDEP at 609-292-1932 for a complete list of available exemptions.

The Waterfront Development Law

The Waterfront Development Law (N.J.S.A. 12:5-3) is a very old law, passed in 1914, that seeks to limit problems that new development could cause for existing navigation channels, marinas, moorings, other existing uses, and the environment.

Any development in a tidally flowed waterway anywhere in New Jersey requires a

Waterfront Development Permit. Examples of projects that need a Waterfront Development Permit include docks, piers, pilings, bulkheads, marinas, bridges, pipelines, cables, and dredging.

For development outside of the CAFRA area, the Waterfront Development Law regulates not only activities in tidal waters, but also the area adjacent to the water, extending from the mean high water line to the first paved public road, railroad or surveyable property line. At a minimum, the zone extends at least 100 feet but no more than 500 feet inland from the tidal water body. Within this zone, NJDEP must review construction, reconstruction, alteration, expansion or enlargement of structures, excavation, and filling.

The Waterfront Development Program exempts the repair, replacement or reconstruction of some legally existing docks, piers, bulkheads and buildings, if the structure existed before 1978 and if other conditions are met. Also, there are exemptions for certain single family homes and for small (5,000 square feet) additions to certain existing structures, if the single family home or structure is located more than 100 feet inland from the mean high water line.

Wetlands serve as buffers that protect upland areas from flooding and damage caused by storms.

Wetlands Act of 1970

The land immediately adjacent to tidal waters often contains coastal wetlands. These wetland areas are a vital coastal resource serving as habitat for many creatures. The wetlands also serve as buffers that protect upland areas from the flooding and damage caused by storms.

The Wetlands Act of 1970 (N.J.S.A. 13:9A) requires NJDEP to regulate development in coastal wetlands. Any time land is located near tidal water there is a good possibility of coastal wetlands on the property. Some signs that may indicate the presence of wetlands are tall reeds and grasses, or ground that is often soggy. The regulated coastal wetlands are shown on maps prepared by the NJDEP. Unlike NJDEP's freshwater wetlands maps, the coastal wetlands maps are used to determine jurisdiction. You must have a coastal wetlands permit to excavate, dredge, fill or place a structure on any coastal wetland shown on the maps.

United States Army Corps of Engineers

The majority of marina development and expansion projects, including dredging, will require a permit from the Army Corps of Engineers. Section 10 of the Rivers and Harbors Act of 1899 gives the Army Corps authority to regulate all work and structures in navigable waters of the United States. Section 404 of the Federal Water Pollution Control Act (a.k.a. Clean Water Act) regulates discharges of dredged or fill materials into navigable waters, including wetlands.

If an Army Corp Section 404 permit is required, the New Jersey Department of Environmental Protection (NJDEP) must investigate the site prior to construction. The NJDEP will document and evaluate water quality and the

potential for pollution and adverse effects to living resources caused by marina siting and construction. The purpose of the Water Quality Certification process is to certify that federally permitted activities will not violate New Jersey's water quality standards. The Water Quality Certification issued by NJDEP is then incorporated into the federal permit.

Site Selection Guidelines

Redevelop Existing Sites. Rather than disturbing pristine areas, place new facilities in previously developed waterfront sites.

- γ CARA [7:7E-1.5(b)1(ii)(viii)]encourages redevelopment of the developed waterfront as well as concentration of development as opposed to development dispersal for purposes of preserving open space.
- γ CAFRA allows some exemptions for maintenance activities but requires NJDEP approval before any new construction work can be done.
- γ Coastal wetlands permits are required before any excavation, dredging, filling, or placement of structures can occur on coastal wetlands.
- γ Any dredging activities must be scheduled around critical life stages of marine organisms and during colder months when dissolved oxygen levels are naturally high. (NJAC 7:7E-7.3A)

Characterize Project Site.

- 👍 Identify habitat types and seasonal use of the site by fish, shellfish, waterfowl, and other organisms.
- 👍 If necessary, hire a private consulting firm to perform the site assessment.

Identify Rare and Endangered Species.

- γ Rare and endangered species may not be disturbed (Federal Endangered Species Act, Natural Resources Article §4-2A-01 et seq., and Natural Resources Article §10-2A-01 et seq.).
- γ Development is prohibited in areas inhabitated with threatened or endangered species unless it can be demonstrated that these species would not be adversely affected. (NJSA 7:7E-3.38)
- γ All proposed development sites must be assessed by the U.S. Fish and Wildlife Service (USFWS) and the New Jersey Department of Environmental Protection for endangered and threatened species and habitat protection areas.
- 👍 For a preliminary screening of a project site, contact your local planning office. Ask them to consult their Natural Resource Inventory.
- 👍 For more precise information concerning sensitive habitat areas, submit a project description and a photocopy of a United States Geological Survey topographic guadrangle map – with the site identified – to NJDEP and USFWS.
- γ If protected species are identified, you must implement an approved protection plan prior to project approval.

Avoid Submerged Aquatic Vegetation. Submerged aquatic vegetation (SAV) provides habitat for shellfish and finfish and food for waterfowl. It is an indicator of good water quality. SAV is classified as a "special area" (N.J.A.C. 7:7E-3.6) and activities in these areas are prohibited except for the following:

- γ Trenching for utility pipelines and cables when no other feasible alternative for alignment exists. Disturbed areas must be restored to preconstruction conditions.
- γ New dredging of State and Federal navigation channels provided there is not feasible alternative to avoid vegetation. Mitigation will be required for destruction of one or more acres.
- γ New and maintenance dredging to remove accumulated sediment from previously authorized navigation and access channels to marinas, lagoons, canals, or boat moorings provided that there is no practicable or feasible alternative to avoid the vegetation.
- γ Dredging activities may be restricted to seasonal operations under the following conditions: if the waterway supports spawning or nursery areas for the endangered shortnose sturgeon, Atlantic sturgeon, alewife, blueback herring, winter flounder, white perch, or striped bass; areas of contaminated sediments including bacterial contamination; and areas within 1,000 meters or less of oyster beds, and known female blue crab winter hibernation areas.
- 👍 Site new or expanded marinas such that navigation over SAV beds is not necessary.

Minimize Disturbance to Wetlands.

- 👍 Minimize disturbance to wetlands and indigenous vegetation in riparian areas.
- 👍 It is the goal of the State to increase wetland acreage and wetland quality by 2005 as called for in NJDEP's 1998-2001 strategic plan.
- γ CAFRA (N.J.A.C. 7:7E-3.27) prohibits disturbance to wetlands unless the proposed activity requires water access or is water oriented as its central purpose. Mitigation is required in cases where loss of wetlands is unavoidable at a replacement rate of at least 2:1.
- γ Any construction that does extend into tidal wetlands requires authorizations, licenses, or permits from the New Jersey Department of Environmental Protection and the Army Corps of Engineers.

Avoid Shellfish Beds.

- γ New or expanded marinas are not permitted in areas that would destroy or adversely impact shellfish beds (N.J.A.C. 7:7E-3.2).
- γ Construction of a dock or boat moorings in shellfish beds is prohibited except for publicly owned fishing piers and waters classified as prohibited from shellfish harvesting (N.J.A.C. 7:7E-3.2).
- γ Shellfish stock may not be harvested from the waters of existing marinas and are classified as prohibited (N.J.A.C. 7:7E-3.2).

Seagrass beds serve as vital nursery areas for juvenile fish. Young fish are 1000 times more abundant in seagrass beds than in areas without seagrasses.

Avoid Critical Migration, Nesting, and Spawning Periods.

- ✓ Schedule construction to avoid critical migration, nesting, and spawning periods of important species of finfish, shellfish, and wildlife.
- 👍 Consult with NJDEP's Division of Fish and Wildlife (609-292-3541) for site-specific determinations of the potential effects of activities on wildlife populations.
- γ Dredging activities must be scheduled around critical life stages of marine organisms (N.J.A.C. 7:7E-7.3A).

Avoid Colonial Waterfowl Nesting and Staging Areas. Regional waterfowl populations converge in certain areas to breed and feed during specific times of year. The preservation of historic nesting and staging areas is vital to the continued existence of many waterbird species. Marinas must be located such that the increased boating activities associated with new or expanded marinas do not deter waterfowl from using historic staging and concentration areas.

- γ CAFRA discourages development that would directly or indirectly adversely impact critical wildlife habitats recognized as historic waterfowl staging areas (N.J.A.C. 7:7E-3.39).

Avoid Geographic and Hydrographic Impediments. Flushing is impeded at the head of tide and in areas where salinity or temperature differences produce variations in water density. Variations in density cause the water column to separate into distinct layers that do not readily mix.

- γ State law promotes water circulation to ensure water quality by requiring that basin depths be no deeper than areas outside the basin. Circulation is also promoted by slip orientation and basin entrance site selection.

Consider Bottom Configuration.

- 👍 A continuous, gradual downward slope from the berthing area into deeper water is ideal.
- 👍 Avoid canals, irregular pockets, and sumps that are deeper than adjacent channels.
- 👍 Avoid square corners in marina basins and dead-end channels to the greatest extent possible.

Follow Natural Channels.

- 👍 Align entrance channels with natural channels to increase flushing.
- 👍 Boat lanes should progressively widen toward the seaward end and narrow toward the inland end to allow water to flow freely and maintain its velocity within the marina.
- 👍 Avoid locating the entrance channel perpendicular to the natural channel as shoaling (and, therefore, dredging) is a potential problem.
- 👍 Avoid long winding channels connecting marinas to open water.
- 👍 Where possible, establish two openings at opposite ends of the marina to promote flow-through currents.

Marina Design and Maintenance

Environmental Concerns

Best Management Practices for Marina Facilities and Structures

- Use Fixed or Floating Piers to Enhance Water Circulation
- Use Environmentally Neutral Materials
- Limit Shaded Areas Over the Water
- Minimize the Need for Dredging
- Minimize the Impacts of Dredging
- Employ Nonstructural Shore Erosion Control Measures
- Conserve Water
- Maintain Structures Using Clean Marina Practices

Best Management Practices for Protecting Sensitive Areas

- Minimize Impervious Areas
- Use Upland and Inland Areas
- Expand Upward
- Conserve Sensitive Land
- Practice Water-wise Landscaping
- Adopt Integrated Pest Management Practices

Best Management Practices for Creating Habitat Areas

- Maintain and/or Develop Vegetated Areas
- Participate in Oyster Restoration Programs

Marina Design and Maintenance

Environmental Concerns

Land management decisions, operating procedures, and structural improvements may all contribute to, or detract from, the quality of the land and water surrounding your marina. Roads and parking areas may convey polluted stormwater directly into adjacent waterways. Dredging may resuspend toxic compounds such as heavy metals, hydrocarbons, and synthetic chemicals. Hazardous chemicals may be leached into the water from piers and other similar structures. Broken or degraded floats may release buoyant debris which birds and fish mistake for food. Finally, the location and installation of shoreside and in-water structures may lead to accelerated coastal erosion and sedimentation. Sedimentation is the rain of soil particles through the water column. It may bury bottom dwelling organisms, block sunlight, reduce the feeding efficiency of visual feeders, and clog fish gills.

Best Management Practices for Marina Facilities and Structures

Use Fixed or Floating Piers to Enhance Water Circulation. While being mindful of the need for pier/dock systems to provide access during routine operations and under emergency circumstances (*e.g.*, evacuation preceding or during a storm), piers, and other structures should be placed to enhance, rather than to obstruct, water circulation.

- 👍 Select an open design for new or expanding marinas. Open marina designs have no fabricated or natural barriers to restrict the exchange of ambient water and water within the marina area.
- ✓ Install wave attenuators to reduce the force of incoming water, if protection is necessary. Wave attenuators do not restrict water exchange nor do they interfere with bottom ecology or aesthetic view. Furthermore, they are easily removed and do not significantly interfere with fish migration and shoreline processes.
- ✓ Design new or expanding marinas with as few segments as possible to promote circulation within the basin. The fewer the segments, the better the circulation.
- ✓ Use a de-ice bubbler system to aerate areas with poor circulation.

Use Environmentally Neutral Materials.

- 👍 For new pilings and other structures that are in or above the water, use materials that will not leach hazardous chemicals into the water and which will not degrade in less than ten years time, *e.g.*, reinforced concrete, coated steel, recycled plastic, plastic reinforced with fiberglass.
- 👍 Be sure to contain shavings when field cutting plastic pilings and timbers.
- ✓ Avoid using wood treated with creosote for pilings and similar structures that are in or above the water. Wood pressure treated with chromated copper arsenate (CCA), ammoniacal copper zinc arsenate (ACZA), or ammoniacal copper arsenate (ACA) is a better option. There is some concern that these pressure

treated timbers may contribute to water pollution, however.

- ✓ Use naturally durable timbers conservatively. Black locust, cedar, chestnut, and white oak are naturally durable but expensive and may be hard to find.
- 👍 Avoid exotic timbers. Some tropical trees, such as greenheart and bongossi, are also naturally durable. Their harvest, however, is harmful to tropical forests.
- 👍 Purchase floatable foams that have been coated or encapsulated in plastic or wood. As these floats age, degraded foam is contained by the covering.

Limit Shaded Areas Over the Water.

- ✓ Near-shore bottom-dwelling organisms require sunlight. In order to provide them with as much sunlight as possible, limit the number of covered slips.

Minimize the Need for Dredging. New marinas must be located in areas where deep water access can be obtained with a minimum of excavation, filling, and dredging. Existing marinas that require maintenance dredging more frequently than once every four years should investigate practicable options to increase circulation or reduce sediment accumulation.

- 👍 Extend piers and docks into naturally deep waters.
- 👍 Locate slips for deep draft boats in naturally deep water.
- 👍 Dredge channels to follow the course of the natural channel.
- ✓ Provide dry storage for smaller boats.

Plan ahead to avoid dredging during critical migration and spawning periods for important species of finfish and shellfish.

Minimize the Impacts of Dredging.

- γ Do not dredge during critical migration or spawning periods of important species of finfish or shellfish (NJAC 7:7E-3.5). Contact New Jersey Department of Environmental Protection to learn when these periods are.
- γ State law (NJAC 7:7E-7.3A) requires that dredging be done around critical life stages of marine organisms and that it shall take place during colder months when dissolved oxygen levels are naturally high.
- 👍 Avoid colonial waterbird nesting areas and historic waterfowl staging and concentration areas. Proximity to these areas is often a permitting consideration.
- γ State regulations employ a variety of BMPs to reduce adverse impacts to areas of ecological importance. BMPs are designed to:
    - reduce the generation of suspended sediments at the dredging site,
    - reduce the migration of contamination when dredging,
    - reduce turbidity in the upper water column, and
    - minimize impacts to benthic communities, anadromous and migratory finfish, nesting shorebirds, colonial waterbirds, etc.
- ✓ Be certain that your dredging contractor selects an appropriate disposal site and containment design. The disposal site must not result in significant adverse impacts to terrestrial or aquatic ecosystems or pose risks to public health. Dredge material must be disposed in accordance with the guidelines specified in NJDEP's technical manual entitled, The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters, Oct. 97.

- 👍 When possible, use dredging methods, like hydraulic dredging, that minimize environmental impacts.
- 👍 When feasible, use turbidity curtains to contain suspended sediments.

Employ Nonstructural Shore Erosion Control Measures.

- γ Nonstructural measures, such as beach nourishment, marsh creation, and other methods that encourage the preservation of the natural environment are the preferred methods of shore erosion control (N.J.A.C. 7:7E-7.11).
- ✓ If non-structural measures alone are not sufficient to control erosion, use revetments, breakwaters, or groins to stabilize and ensure the long-term viability of the non-structural controls.
- ✓ As a last resort, use structural controls in this order of preference. shoreline revetments, breakwaters, groins, and bulkheads.
- 👍 Minimize the adverse effects of erosion control projects on adjacent properties, navigation, threatened or endangered species, significant historic or archaeological resources, and oyster bars.

Conserve Water.

- 👍 Equip all freshwater hoses with automatic shutoff nozzles.
- 👍 Fix leaks and drips.
- ✓ Install "low-flow" faucets, toilets, and shower heads.

Maintain Structures Using Clean Marina Practices.

- 👍 Scrape, sand, and paint in-water and land-side structures according to the same management principles as for vessels (refer to the Vessel Maintenance and Repair chapter).
- ✓ If feasible, move floating structures to shore for scraping, painting, and major repairs.

Best Management Practices for Protecting Sensitive Areas

Minimize Impervious Areas.

- 👍 Keep paved areas to an absolute minimum, *e.g.*, just designated work areas and roadways for heavy equipment.

Use Upland and Inland Areas.

- 👍 Locate buildings, workshops, and waste storage facilities in upland areas, away from fragile shoreside ecosystems, to the greatest extent possible. Upland areas also provide a measure of protection against floods.
- 👍 Locate parking and vessel storage areas away from the water where feasible.
- ✓ Consider inland areas for boat repair activities and winter storage. Use hydraulic trailers to quickly and easily move boats to inland storage locations.

Expand Upward.

- ✓ Rather than adding wet slips, expand storage capacity by adding dry-stack storage. Boatels provide the following environmental benefits:
    - Dry-stacked boats do not accumulate marine growth. Consequently, toxic antifouling paints are not necessary and the associated need to wash, scrape, and paint is eliminated.
    - Dry-stacked boats are less likely to accumulate water in their bilges. They are, therefore, less likely to discharge oily bilge water.
- 👍 Control stormwater runoff from dry-stack areas as well as from any expanded parking areas.
- 👍 Keep forklifts well-tuned to prevent grease or oil from dripping onto staging areas or into the water.

Conserve Sensitive Land.

- ✓ Provide a serene setting for your marina by placing adjacent, sensitive land in a conservation trust. Income, estate, and property tax benefits are available.
- ✓ Participate in conservation easement programs to preserve farmland, forestland, waterfront, wetlands, rare or unique areas, scenic areas, endangered species habitat, historic properties, and open space.
- ✓ Sell or donate the land (or the development rights to the land) to a local land trust or a non-profit organization such as The Nature Conservancy.

Practice Water-wise Landscaping. Save on water bills, reduce your maintenance activities, and protect water quality by minimizing your water use.

- 👍 Water only when plants indicate that they are thirsty: shrubs will wilt and grass will lie flat and show footprints. Water in the early morning or early evening as temperatures are generally cooler. Plants will not be shocked and water loss to evaporation will be minimized.
- 👍 Select plants that are suited to the existing conditions (*i.e.,* soil, moisture, and sunlight) so that they will require little care in terms of water, fertilizer, and pesticides. Refer to *Appendix VI* for a sampling of beneficial plants.
- 👍 Water deeply and infrequently rather than lightly and often. Deep watering promotes stronger root systems that enable plants to draw on subsurface water during hot spells and droughts.
- 👍 Select equipment that delivers water prudently. Sprinklers work well for lawns. Soaker hoses or drip irrigation systems deliver water directly to the roots of shrubs, flowers, and vegetables with minimal loss to evaporation.
- 👍 Place mulch (wood chips, bark, grass clippings, nut shells, etc.) to a depth of 3-4" around plants to keep water in the soil, prevent weeds, and reduce the amount of sediment picked up by stormwater. Planting groundcovers at the base of trees serves the same function.
- 👍 Group plants with similar water needs together. This practice will ease your maintenance burden, conserve water, and benefit the plants.
- ✓ Replace lawn areas with wildflowers, groundcover, shrubs, and trees.
- ✓ Recycle "gray water." Gray water is water that has been used once-maybe for dishwashing or in a washing machine-but is not overly contaminated. It can be filtered and used to water landscaped areas. Because regulations

Plant native plants. They require little care because they require less water and virtually no fertilizer or pesticides.

vary, be sure to check local ordinances for permit requirements and written approval before pursuing this option.

✓ Collect rainwater by directing downspouts into covered containers. Use the collected water on your landscaped areas.

Adopt Integrated Pest Management Practices. Because of your proximity to the water, it is important to avoid toxic lawn and garden chemicals to the greatest extent possible. Instead, deter unwanted plants or animals with Integrated Pest Management practices. Integrated Pest Management employs preventive, cultural, biological, and chemical methods to control pests while minimizing impacts to non-target species, wildlife, and water quality.

Natural predators such as spiders, dragonflies, birds, frogs, and lizards can eliminate the need for harmful pesticides.

- 👍 Select plants that are disease and insect resistant, that will out-compete common weeds, and that can thrive on your property, Refer to the Master Gardner list of native plants (*Appendix VI*) and consider the degree of sun exposure, slope, drainage, amount of shade, wind, volume of foot traffic, soil type, temperature variations, and other environmental factors.
- 👍 Mow lawn areas properly to suppress weeds. Varieties of grass that grow better in cooler weather should be mowed to no less than 2.5 inches in height. Grasses that grow better in warm weather should be mowed to no less than 1.5 inches.
- 👍 Pull weeds by hand to reduce reliance on herbicides.
- 👍 Boost your own tolerance for weeds and other pests. If it is not actually harming anything, leave it alone.
- 👍 Foster natural predators such as spiders, praying mantis, dragonflies, lacewings, soldier beetles, birds, bats, frogs, lizards, and certain snakes and toads.
- 👍 Use natural agents such as milky spore disease for grubs and Japanese beetles, Bacillus thuringiensis (BT) to control mosquito and small moth larvae, and sabadilla for chinch bugs.
- 👍 Use pesticides only after all other options have been exhausted. Use organic alternatives to chemical pesticides. Also, rather than broadcasting pesticides, apply them directly to problem areas.
- 👍 Treat only serious or threatening intolerable pest infestations.
- 👍 Purchase the least toxic chemical in the smallest amount practical.
- 👍 Do not use pesticides just before a rainfall or on a windy day.
- 👍 Apply insecticides during the evening when honeybees and other beneficial insects are less active.
- 👍 Do not apply pesticides near water, *e.g.*, shore, wells, streams, ponds, bird baths, swimming pools, etc.

Best Management Practices for Creating Habitat Areas

Maintain and/or Develop Vegetated Areas. Vegetation filters and slows the flow of surface water runoff, stabilizes shorelines, and provides wildlife habitat, flood protection, and visual diversity.

- 👍 Maintain vegetated buffers (grassy or wooded) between all impervious areas (*e.g.*, parking lots and boat storage areas) and the water.

- Plant vegetated areas with "beneficial" plants: those plants that require minimal care in terms of trimming, watering, and applications of fertilizer and pesticides. Native, or indigenous, plants demand little care since they are adapted to the local climate and soil types. Also, many horticultural varieties and imported plants may be considered beneficial if they have few maintenance requirements and if they do not displace naturally occurring vegetation (that is, if they are not invasive). Refer to *Appendix VI* Select perennial plants instead of annuals. Perennial plants need only be planted once, tend to shade out most weeds, and few require additional water or maintenance.
- Choose plants that bear flowers, fruit, nuts, and seeds to attract birds, small mammals, and other wildlife.
- Maintain proper soil pH and fertility levels. Fertility describes the presence of nutrients and minerals in the soil. Acidity and alkalinity levels are indicated by pH. These two measures together tell you which plants your soil can support. Soil pH may be adjusted by adding lime (base) or gypsum (acid). Add organic matter such as compost, leaf mold, manure, grass clippings, bark, or peat moss to improve fertility.
- Annually, submit a soil sample to the Rutgers Cooperative Extension Service to determine fertility, pH, and application rates for soil amendments. For additional information visit the Rutgers website at www.rce.rutgers.edu/ag or call 732-431-7260 for Monmouth County or 732-349-1246 for Ocean County offices.
- Foster beneficial critters. For example, earthworms move through the soil feeding on microorganisms. In the process, they aerate the soil, improving the flow of water and air to plant roots.
- Compost leaves, branches, grass trimmings, and other organic matter. Use the mature compost to nourish your soil. Alternatively, chip branches and leaves and use as mulch to discourage weeds and to conserve moisture. More complete information on composting is available from the Rutgers Cooperative Extension Service. Visit their website at www.rce.rutgers.edu or call 732-431-7260.

Participate in Oyster Restoration Programs. Oyster reefs provide food and habitat for hundreds of animals. The oysters themselves improve water quality by filter-feeding on microscopic algae. A single 3-inch oyster can filter up to 50 gallons of water a day. Benefits accrue to marinas as well. Marina owners noticed that tenants became more cautious about waste disposal once they begin participating in oyster restoration programs.

- ✓ Become an oyster "gardener." Work with the NY/NJ Baykeeper to build and install a float system for growing oysters. You will tend to seed oysters for 12 to 14 months, after which time the oysters will be transplanted to non-harvested oyster bars. Do not eat oysters grown in marinas! They will likely contain heavy metals from bottom paints and possibly bacteria from sewage discharges.

A single 3-inch oyster can filter up to 50 gallons of water a day. Work with the NY/NJ Baykeepr to become an "oyster gardener" by building a float system for growing oysters.

Stormwater Management

Environmental Concerns

Legal Setting

- General Permit for Discharges from Marinas
- State Law: Sediment Control and Stormwater Management
- Coastal Area Facility Review Act

Best Management Practices Control Stormwater Runoff

- Practice Low Impact Development
- Cultivate Vegetated Areas
- Minimize the Amount of Impervious Area
- Use Structural Controls as Necessary
- Control Sediment from Construction Sites
- Stencil Storm Drains

Stormwater Management

Environmental Concerns

Stormwater runoff is precipitation that has not been absorbed by the ground. Rather, it washes over the surface of the land picking up pollutants as it travels. Stormwater runoff may collect soil particles, petroleum products, residues from industrial activities, litter, and pet waste. All of these pollutants are carried with the runoff into surface waters where they adversely impact water quality.

Vegetation can disrupt the flow of stormwater as it flows across the land. Plant native plants in areas that can intercept stormwater before it reaches the waterway.

The volume of stormwater runoff increases as natural forests and fields are replaced with hard surfaces such as buildings, parking lots, driveways, and roads. Also, without any plants to disrupt the flow, stormwater moves across the land more quickly than it did under predevelopment conditions. This greater, faster flow of stormwater can severely degrade receiving water bodies by accelerating erosion which leads to flooding, destruction of plant and animal life, and loss of habitat. Also, pollutants carried by stormwater impair water quality by increasing levels of nitrogen, phosphorous, suspended solids, biological oxygen demand, and chemical oxygen demand. Temperatures and levels of toxic metals and hydrocarbons tend to increase, dissolved oxygen decreases, and the acidity-alkalinity of the water typically changes. The result is that near shore areas are less able to support wildlife like young fish and crabs. Also, using the water for human recreation becomes less desirable.

Legal Setting

General Permit for Discharges from Marinas

All marinas or other facilities that conduct boat repair, painting, or maintenance (including washing) are required to obtain a General Permit for Discharges from Marinas from the New Jersey Department of the Environmental Protection (NJDEP). The permit covers stormwater and nonstorm wastewater discharges from:

- areas involved in boat maintenance (rehabilitation, mechanical repairs, painting, and fueling) and cleaning operations,
- wastewater discharges to surface or groundwater from boat and equipment washing areas, and
- noncontact cooling water and condensate discharges to surface waters from ice machines, refrigeration units, and other machinery.

The control of pollutants that may be carried by stormwater runoff from vessel maintenance areas is addressed in Vessel Maintenance. Please refer to *Laws and Regulations* for more information about the General Permit for Discharges from Marinas.

State Law: Sediment Control and Stormwater Management

New Jersey has designed a comprehensive erosion and sediment control program to reduce the impacts from stormwater runoff, to retard nonpoint pollution from sediment and to conserve and protect the land, water, air and other environmental resources of the State. New Jersey Law (P.L. 1975, Chapter 251, N.J.S.A 4:29-39 et seq.) requires that any construction project that disturbs 5,000 square feet or more of land must have an approved plan for soil erosion and sediment control before construction can begin. Plans are submitted to and approved by the local Soil Conservation District. For construction projects that disturb five or more acres, you must also obtain coverage under the NJPDES General Stormwater Permit for Construction Activities.

Coastal Area Facility Review Act (CAFRA)

The Coastal Area Facility Review Act requires that the impacts of any development or redevelopment within the Coastal Zone be reduced by adopting measures to control stormwater runoff. Stormwater facilities must be designed to eliminate all runoff caused by the development in excess of that which would have come from the site if it were in its pre-development state. Development activities must minimize the amount of impervious surfaces, minimize the amount of stormwater generated, minimize the rate and volume of stormwater runoff, maintain existing on-site infiltration, simulate natural drainage systems and minimize the discharge of pollutants to ground or surface waters. A waterfront development permit must be obtained from NJDEP before any work can begin.

Best Management Practices to Control Stormwater Runoff

Practice Low Impact Development. The goal of low impact development is to develop a site without altering the existing hydrologic cycle. The approach takes advantage of a site's natural features-including vegetation-to minimize the need to build expensive stormwater control devices. It is counter to traditional stormwater management that uses structures like curbs, gutters, and storm drains to move water off-site as efficiently as possible. Traditional structures cause unnatural volumes of runoff to move into receiving waters at high velocity.

- Capture and treat stormwater on site.
- ✓ For example, direct the runoff from your parking lot to a bioretention area rather than toward a storm sewer pipe. A “rain garden” is an example of a bioretention area. It is an area planted with native vegetation and sited such that it collects stormwater. Water, nutrients, and pollutants are taken up by soil and plants within 24 to 48 hours after a storm. Rain gardens have the added advantage of being attractive areas that can provide shade and wildlife habitat, act as wind breaks, and muffle noise.

State law requires areas within the coastal zone to minimize the amount of stormwater generated from a particular site in order to reduce and control the discharge of pollutants.

✓ Contact Prince George's County Department of Environmental Resources in Maryland for additional information about low impact development and rain gardens (301-883-5833).

Cultivate Vegetated Areas. Healthy soil and vegetation capture, treat, and slowly release stormwater. The water is cleaned through a combination of microbial action in the soil, vegetative uptake, evaporation, and transpiration.

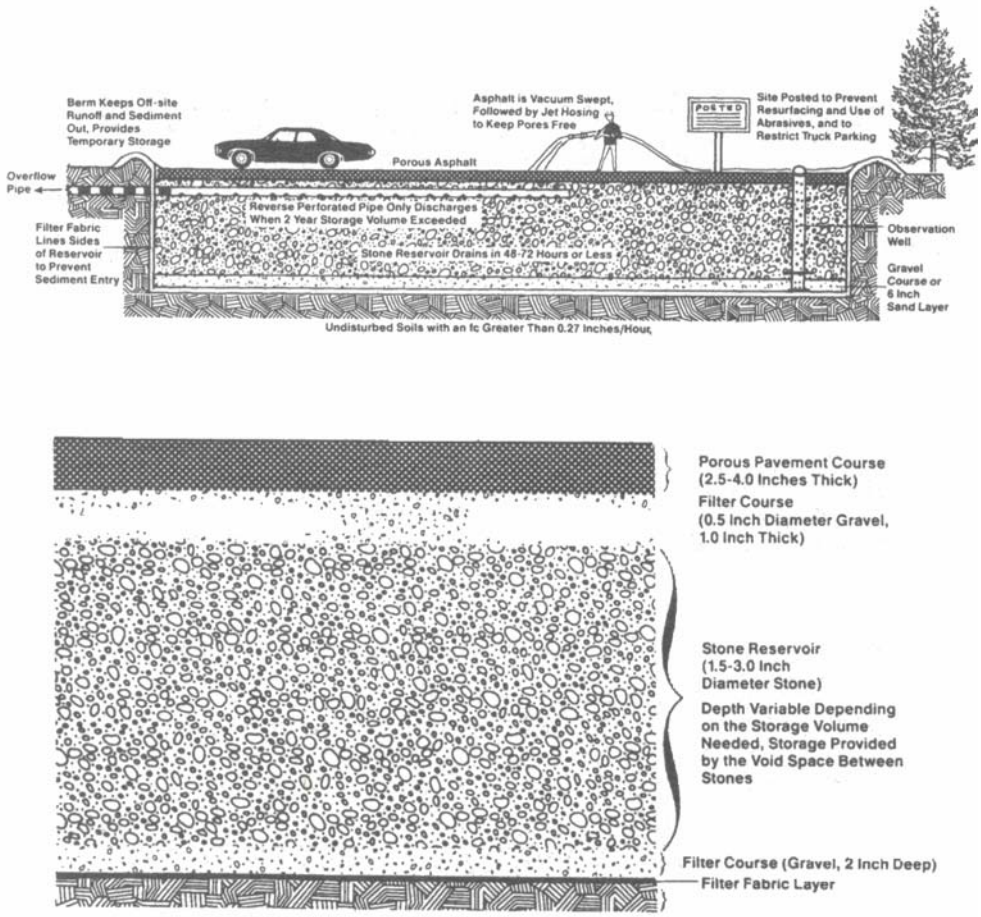
- 👍 Plant environmentally-sensitive landscapes at the edge of parking lots and within islands in parking lots. Refer to *Appendix VI* for information about the Rutger's Master Gardner Program.
- 👍 Plant vegetated buffers between your upland property and the water's edge.
- 👍 Position downspouts so that they drain to vegetated areas-avoid draining to concrete or asphalt.
- ✓ Construct wetlands to remove pollutants, shelter the coast from storms, and provide habitat for aquatic species and birds.
- ✓ Use grassed swales to direct stormwater on your property. Grassed swales are low gradient conveyance channels planted with erosion-resistant vegetation. They improve water quality by filtering out particulates, taking up nutrients, and promoting infiltration. Also, water generally moves more slowly over a grassed swale than it would in a pipe, Grassed swales are not practical on very flat land, on steep slopes, or in wet or poorly drained soils.

Consider alternatives to asphalt and concrete for parking lots and vessel storage areas. Gravel and seashells are aesthetically pleasing and allow rainwater to infiltrate into the ground.

Minimize the Amount of Impervious Area. The less impervious area on site, the less runoff you will have to manage.

- 👍 Pave only those areas that are absolutely necessary.
- 👍 Minimize the length of new roadway required to serve new or expanding marinas.
- 👍 Plan roads so they do not cross sensitive areas such as tidal wetlands.
- 👍 Consider alternatives to asphalt for parking lots and vessel storage areas, *e.g.*, dirt, gravel, seashells, engineered porous pavement. See Figure I for a depiction of porous pavement.
- ✓ Investigate a non-toxic, organic soil binder derived from the Plantago plant family. When this binder is combined with crushed aggregate (*e.g.*, gravel, shells) and soil, it creates a somewhat permeable surface that will not erode. For less than or equal to the cost of asphalt, it is a resilient material that will not crack during winter freeze/thaw cycles, can be repaired by adding more material and tilling the surface, and can be dug up with a shovel to plant trees and shrubs.

Figure 1. Porous Pavement



Source: Schueler, T.R. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban Best Management Practices.* Washington, DC: Metropolitan Washington Council of Governments.

Use Structural Controls as Necessary. Because of space limitations or other constraints, it may be necessary to adopt more traditional practices such as pond systems, wetland systems, infiltration systems, and filter systems.

- Stormwater pond systems capture and slowly release storm flows. Ponds may be permanent (retention ponds) or may hold water only temporarily (detention ponds). A Dry Extended Detention pond is an example of a stormwater pond system (see Figure2). Dry Extended Detention Ponds hold runoff for up to 24 hours after a storm. Water is slowly released through a fixed opening. The pond is normally dry between storms. This type of structure is effective for sites that are 10 acres or greater in size.
- Stormwater wetland systems are designed to mimic the ability of natural wetlands to cleanse and absorb storm flows. A Pocket Wetland (see Figure 3) is

created by excavating to the high water table elevation. Pocket wetlands can serve drainage areas of 5 to 10 acres.

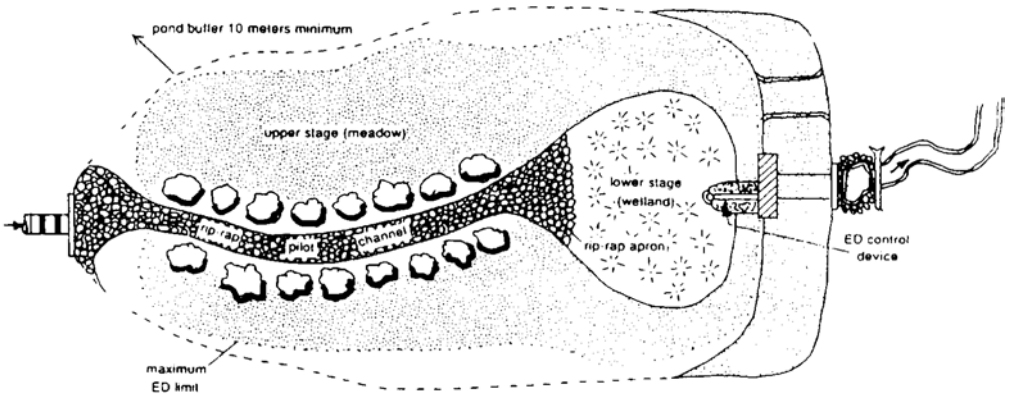
- Infiltration systems are designed to take advantage of soil's natural infiltration capacities and pollutant removal characteristics. A Dry Well (see Figure 4) is an infiltration system designed to treat roof top runoff. Water is collected in downspouts and directed into a filter composed of crushed stone and fabric. Rain gardens and porous pavement are other examples of infiltration systems.
- Filter systems "strain" runoff to remove pollutants. Conventional Sand Filter Systems (see Figure 5) are constructed of layers of sand, from most course on top to most fine below. The sand overlies either a gravel bed (for infiltration) or perforated underdrains (for discharge of treated water). Oil Grit Separators (see Figure 6) are another form of filter system. Water from parking lots and other areas likely to have hydrocarbons should be directed through Oil Grit Separators (or oil absorbent fabric) before entering any other management structure.

👍 ALL stormwater management structures must be maintained in order to be effective.

✓ Refer to *Table 1* for assistance selecting a structure that is appropriate for your property.

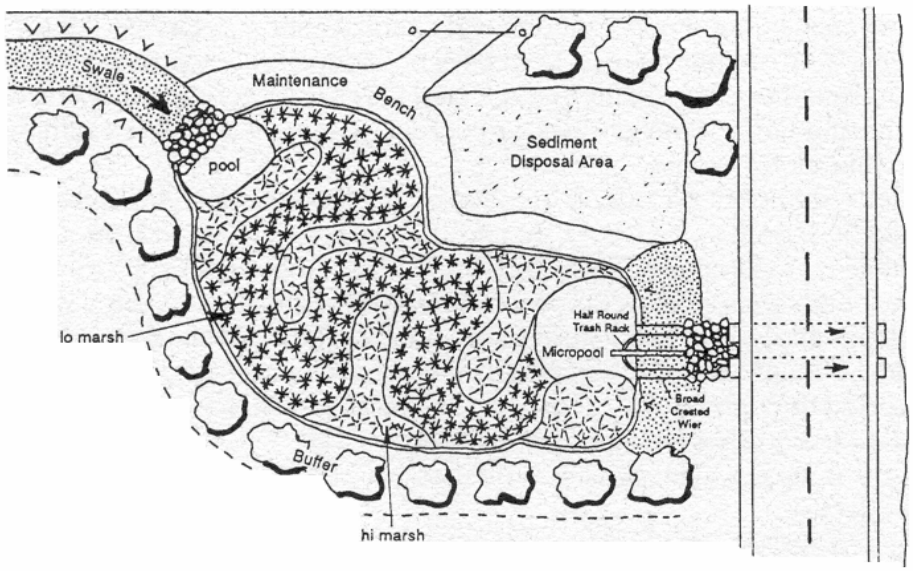
✓ Contact NJDEP's Division of Watershed Management (609-984-0058) for information about grant funding to local governments for the installation of stormwater management structures in existing developed areas.

Figure 2. Dry Extended Detention Pond



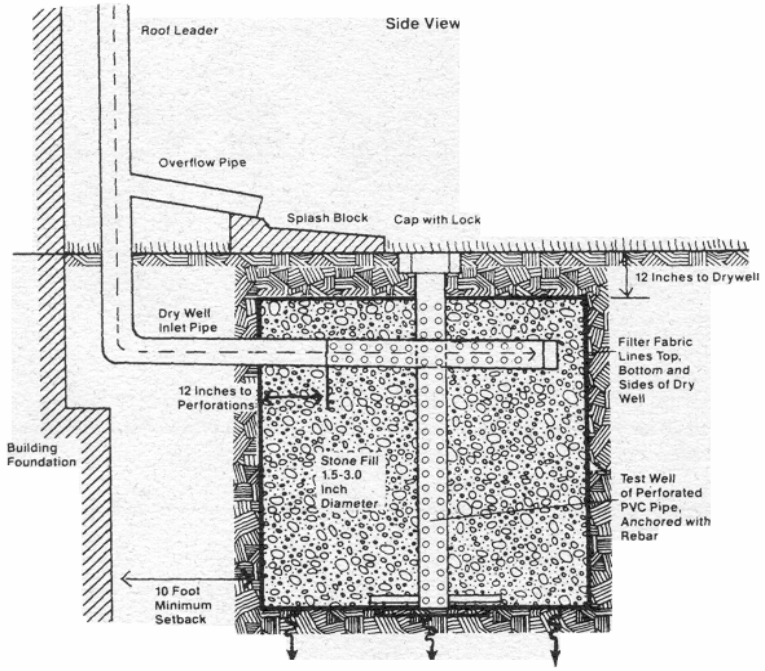
Source: Schueler, T.R. 1991. "Mitigating the Adverse Impacts of Urbanization on Streams: A Comprehensive Strategy for Local Governments," *Proceedings of the National Conference Integration of Stormwater and Local Nonpoint Source Issues.* Northern Illinois Planning Commission.

Figure 3. Pocket Wetland



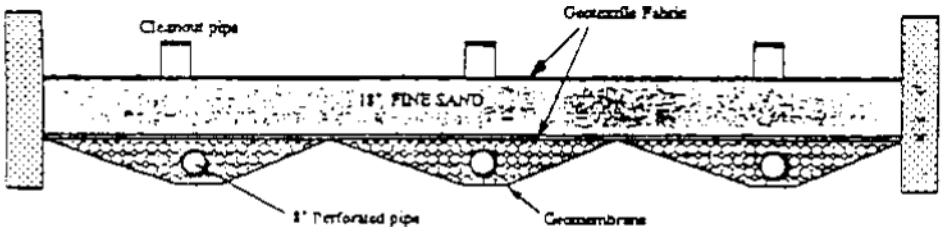
Source: Schueler, T.R. 1992. *Design of Stormwater Pond Systems.* Washington, DC: Metropolitan Washington Council of Governments.

Figure 4. Dry Well



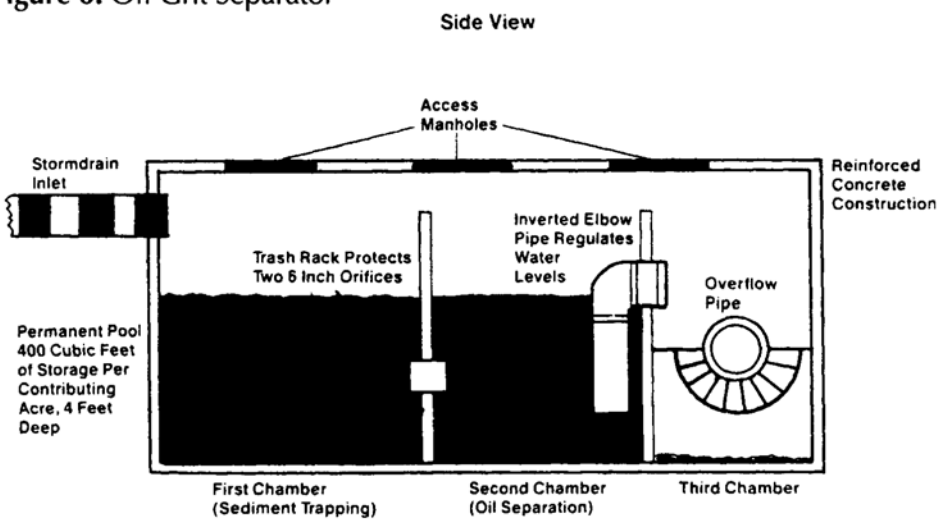
Source: Schueler, T.R. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban Best Management Practices.* Washington, DC: Metropolitan Washington Council of Governments.

Figure 5. Sand Filter



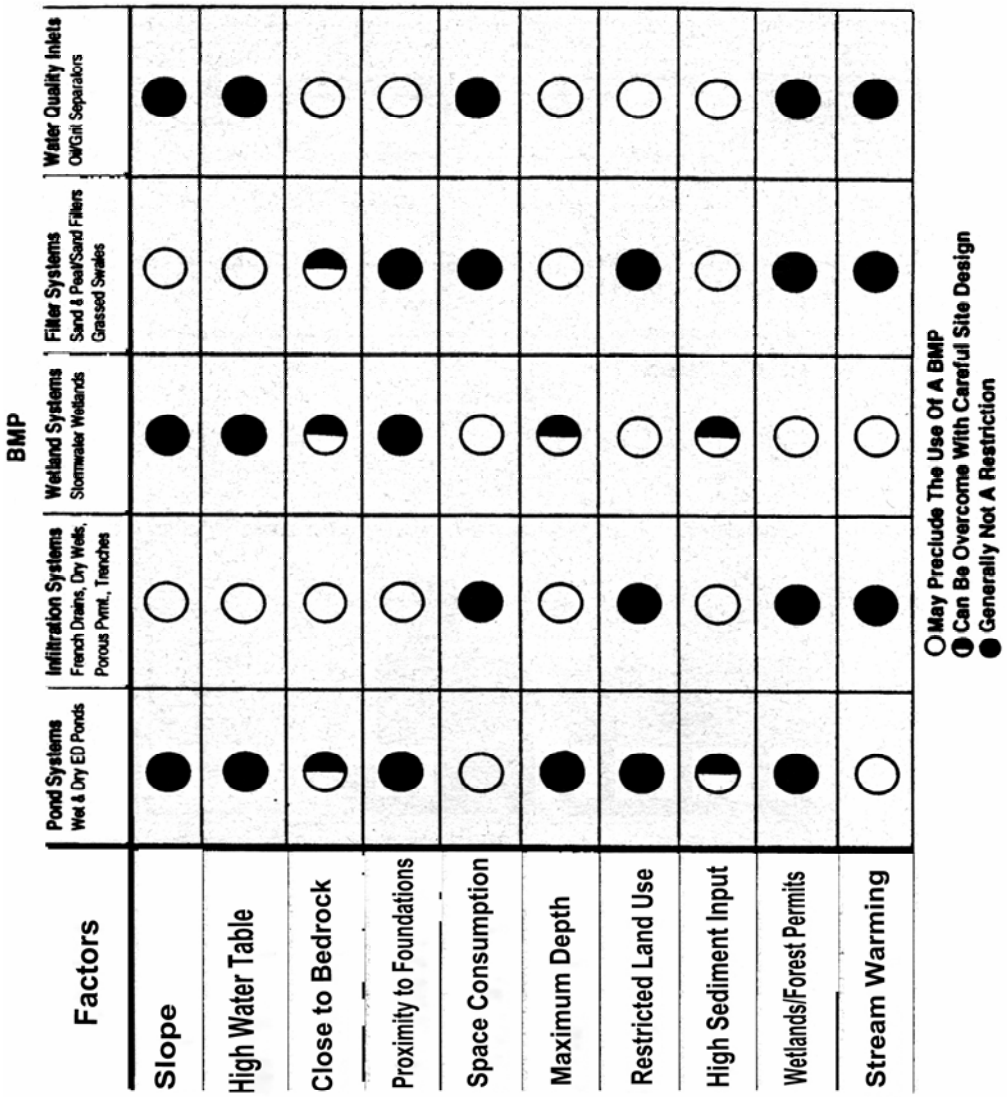
Source: City of Austin. 1991. *Design Guidelines for Water Quality Control Basins.* Austin, TX: Public Works Department.

Figure 6. Oil Grit Separator



Source: Schueler, T.R. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban Best Management Practices.* Washington, DC: Metropolitan Washington Council of Governments.

Table 1. Screening Tools for Stormwater Management Best Management Practices Physical Feasibility



Source: Kumble, Peter, Lorraine Herson-Jones, and Thomas Schueler. 1993a. *Applicant's Guide for 10% Rule Compliance.* Annapolis, MD: Chesapeake Bay Critical Area

Control Sediment from Construction Sites.

γ Use devices such as hay bales, silt fences, storm drain filters, sediment traps, and earth dikes to prevent sediments from leaving construction areas.

Stencil Storm Drains.

👍 Stencil storm drains with the words “Don't Dump” and “Drains to River” (if appropriate). Stencils and instructions are available from Clean Ocean Action at 732-872-0111 and the Center for Marine Conservation at 202-429-5609. Be sure to get permission from the municipality that maintains storm drains in your community. Generally, it is the Department of Public Works.

Vessel Maintenance and Repair

Environmental Concerns

Legal Setting

- General Permit for Discharges from Marinas

Best Management Practices to Control Pollution from Vessel Maintenance and Repair Activities

- Designate Work Areas
- Contain Dust from Sanding
- Contain Debris from Blasting
- Minimize Impacts of Pressure Washing Minimize Impacts of Paints
- Minimize Impacts of' Painting Operations
- Reduce Overspray
- Handle Solvents Carefully
- Repair and Maintain Engines with Care
- Winterize Safely
- Conduct In-Water Maintenance Wisely
- Educate Boaters

Clean Boating: Tip Sheet Vessel Cleaning and Maintenance

Vessel Maintenance and Repair

Environmental Concerns

Toxic heavy metals are often associated with paints. Care must be taken when sanding and pressure washing boat hulls. When heavy metals are washed into the water, they accumulate in fish tissue.

Vessels require a great deal of attention. They must be scraped, painted, and cleaned. Their engines need to be lubricated and otherwise tended. They need to be prepared to withstand the cold of winter.... Each of these activities has the potential to introduce pollutants into the environment.

Sanding, blasting, and pressure washing are meant to remove paint and marine growth. In the process, toxic heavy metals such as copper and tin may be released. If heavy metals find their way into the water, they may be consumed by mussels, worms, and other bottom-dwelling creatures and passed up the food chain to fish, birds, and humans. Heavy metals that are not incorporated into living tissue will remain in the sediments where they will substantially increase the cost of dredge spoil disposal.

Paints, solvents, thinners, and brush cleaners generally are toxic and may cause cancer. If spilled, they may harm aquatic life and water quality. Additionally, the fumes-known as volatile organic compounds (VOCs)-released by some paints and solvents contribute to air pollution. Likewise, oil and grease from maintenance areas threaten aquatic life.

Many of the cleaning products meant to be used in boat shops are also toxic. Many contain caustic or corrosive elements. They may also contain chlorine, phosphates, inorganic salts, and metals. Even non-toxic products are harmful to wildlife. For example, detergents found in many boat cleaning products will destroy the natural oils on fish gills, reducing their ability to breathe.

Legal Setting

General Permit for Discharges from Marinas

As described earlier, all marinas that perform vessel maintenance and repair (including washing) must obtain a General Permit for Discharges from Marinas from the New Jersey Department of the Environmental Protection (NJDEP). The permit requires marina operators to control pollutants from vessel maintenance and wash areas. Please refer to *Laws and Regulations* for more information about the General Permit for Discharges from Marinas.

Best Management Practices to Control Pollution from Vessel Maintenance and Repair Activities

Designate Work Areas. One of the easiest ways to contain waste is to restrict the area where maintenance activities may be performed.

- Perform all major repairs-such as stripping, fiberglassing, and spray painting-in designated areas.
- Collect all maintenance debris. Clean work areas after completing each operation or at the end of the day-whichever comes first. Remove sandings, paint chips, fiberglass, trash, etc.
- Locate the maintenance area as far from shore as possible.
- ✓ Vessel maintenance areas should have an impervious surface (*e.g.*, asphalt or cement) and, where practical, a roof. Sheltering the area from rain will prevent stormwater from carrying debris into surface waters.
- ✓ If asphalt or cement is not practical, perform work over filter fabric or over canvas or plastic tarps. Filter fabric will retain paint chips and other debris yet-unlike plastic, or to a lesser extent, canvas-filter fabric will allow water to pass through. Tarps may potentially be re-used multiple times.
- Surround the maintenance area with a berm or retaining wall.
- Use vegetative or structural controls cited in Stormwater Management to treat stormwater runoff.
- Establish a schedule for inspecting and cleaning stormwater systems. Remove paint chips, dust, sediment, and other debris. Clean oil/water separators.
- Prohibit extensive maintenance or repair work outside of the designated maintenance areas.
- Clearly mark the work area with signs, *e.g.*, "Maintenance Area for Stripping, Fiberglassing, and Spray Painting."
- Post signs throughout the boatyard describing best management practices that boat owners and contractors must follow, *e.g.*, "Use Tarps to Collect Debris."
- Develop procedures for managing requests to use the workspace, to move boats to and from the site, and to ensure the use of best management practices.

The best way to control pollution from maintenance areas is through "good housekeeping" practices. Keep work areas neat and orderly by cleaning-up frequently.

Contain Dust from Sanding.

- Do not let dust fall onto the ground or water or become airborne.
- Invest in vacuum sanders and grinders. These tools collect dust as soon as it is removed from the hull. Vacuum sanders allow workers to sand a hull more quickly than with conventional sanders. Additionally, because paint is collected as it is removed from the hull, health risks to workers are reduced.
- Require tenants and contractors to use vacuum sanders. Rent or loan the equipment to tenants and contractors.
- ✓ Post signs indicating the availability of vacuum sanders and grinders.
- ✓ Bring vacuum sanders to tenants if you see them working with non-vacuum equipment.
- Conduct shoreside sanding in the hull maintenance area or over a drop cloth.
- Restrict or prohibit sanding on the water to the greatest extent practical.

- When sanding on the water is unavoidable, use a vacuum sander and keep dust out of the water.
- Collect debris. Have your waste hauler characterize the waste and take it to a facility authorized to manage municipal or industrial solid waste, provided that, if the waste is hazardous, the amount generated is less than 220 pounds per month or less than this amount is accumulated at any time.

Contain Debris from Blasting.

- Prohibit uncontained blasting.
- Perform abrasive blasting in the vessel maintenance area within a structure or under a plastic tarp enclosure. Do not allow debris to escape from the enclosure.
- ✓ Investigate alternatives to traditional media blasting. Hydroblasting and mechanical peeling essentially eliminate air quality problems. Debris must still be collected, however. Consider using a filter cloth ground cover.
- ✓ Avoid dust entirely by using a stripper that allows the paint to be peeled off. These products are applied like large bandages, allowed to set, and are then stripped off. When the strips are removed, the paint is lifted from the hull. Dust and toxic fumes are eliminated.
- ✓ Invest in a closed, plastic medium blast (PMB) system. These systems blast with small plastic bits. Once the blasting is completed, the spent material and the paint chips are vacuumed into a machine that separates the plastic from the paint dust. The plastic is cleaned and may be reused. The paint dust is collected for disposal. A 50-foot vessel will produce about a gallon of paint dust, substantially less than the many barrels full of sand and paint that must be disposed of with traditional media blasting methods.
- Collect debris. Have your waste hauler characterize the waste and take it to a facility authorized to manage municipal or industrial solid waste, provided that, if the waste is hazardous, the amount generated is less than 220 pounds per month or less than this amount is accumulated at any time.

Consider investing in a plastic medium blast (PMB) system for stripping paint. Spent material and paint chips are vacuumed and separated for plastic material reuse and paint chip disposal.

Minimize Impacts of Pressure Washing.

- ✓ Remove visible solids from wash water before it is discharged. At a minimum, allow large particles to settle out. More thorough treatment involves filtration or chemical or physical techniques to treat the rinse water:
  - filtration uses devices such as screens, filter fabrics, oil/water separators, sand filters, and hay bales to remove particles;
  - chemical treatment relies upon the addition of some type of catalyst to cause the heavy metals and paint solids to settle out of the water; and
  - swirl concentrators are examples of physical structures that can be used to concentrate pollutants. They are small, compact soil separation devices with no moving parts. Water flowing into a concentrator creates a vortex that centralizes the pollutants. Clean water is then discharged.

- ✓ Discharge treated wash water to surface water if no detergents or other chemical cleaning agents were used. If detergents were used, the wastewater must be directed into a sewer system.
- ✓ Alternatively, reuse the wash water. For example, recycle it through the power washing system (a closed water recycling operation) or use it to irrigate landscaped portions of the marina. The recycled water may be treated with an ozone generator to reduce odors.
- 👍 Pressure wash over a bermed, impermeable surface that allows the waste water to be contained and filtered to remove sediments.
- 👍 When pressure washing ablative paint, use the least amount of pressure necessary to remove the growth but leave the paint intact. Where practical, use a regular garden-type hose and a soft cloth.
- 👍 Collect debris. Have your waste hauler characterize the waste and take it to a facility authorized to manage municipal or industrial solid waste, provided that, if the waste is hazardous, the amount generated is less than 220 pounds per month or less than this amount is accumulated at any time.

Box 1. Bottom Paints

Antifouling bottom paints protect hulls from barnacles and other types of fouling organisms that can interfere with vessel performance. Pesticides within them also harm fish and other non-target species. Most paints work by slowly releasing a biocide, generally cuprous oxide (Cu_2O).

Copper-based paints are not used on aluminum hulls; the interaction of copper and aluminum leads to corrosion. Instead, tin-based paints (tributyl tin or TBT) are often used on aluminum-hulled vessels. Because tin is extremely toxic, it must be applied cautiously. Concentrations of TBT as low as a few parts per trillion have caused abnormal development and decreased reproductive success in oysters, clams, and snails (EPA 1993). Tin is easily absorbed by fish through their gills and accumulates to high levels in sediments. For these reasons, Federal law restricts the use of tin-based paints to aluminum vessels, boats larger than 82 feet (25 meters), and outboard motors and lower drive units. Any boatyard operator wishing to apply TBT paints must obtain a pesticide business license and employ an applicator certified to apply TBT.

Antifouling paints can be separated into three general categories:

Leaching Paints. Water soluble portions of leaching antifouling paints dissolve slowly in water, releasing the pesticide. The insoluble portion of the paint film remains on the hull. The depleted paint film must be removed before the boat is repainted. Most leaching paints are solvent based. Consequently, fumes are a concern.

Ablative Paints. Ablative antifouling paints also leach some toxicant into the water. The major difference is that as the active ingredient is leached out, the underlying film weakens and is polished off as the boat moves through the water. As the depleted film is removed, fresh antifouling paint is exposed. There are several water-based ablative paints on the market that are up to 97% solvent free. As a result, levels of volatile organic compounds are substantially reduced as compared to solvent-based paints. Ease of clean up is another advantage of water-based paints.

Non-toxic Coatings. Teflon, polyurethane, and silicone paints are nontoxic options. All deter fouling with hard, slick surfaces.

Minimize Impacts of Paints.

- 👍 Recommend antifouling paints that contain the minimum amount of toxin necessary for the expected conditions to your customers.
- 👍 Avoid soft ablative paints.
- 👍 Use water-based paints whenever practical.
- ✓ Stay informed about antifouling products, like Teflon, silicone, polyurethane, and wax, that have limited negative impacts. Pass the information along to your customers.
- ✓ Store boats out of the water, where feasible, to eliminate the need for antifouling paints.

Minimize Impacts of Painting Operations.

- 👍 Use brushes and rollers whenever possible.
- 👍 Reduce paint overspray and solvent emissions by minimizing the use of spray equipment.
- 👍 Prohibit spray painting on the water.
- 👍 Limit in-water painting to small jobs. Any substantial painting should be done on land, in the vessel maintenance area, and/or over a ground cloth.
- 👍 If painting with brush or roller on the water, transfer the paint to the vessel in a small (less than one gallon), tightly covered container. Small containers mean small spills.
- 👍 Mix only as much paint as is needed for a given job.
- ✓ Mix paints, solvents, and reducers in a designated area. It should be indoors or under a shed and should be far from the shore.
- ✓ Keep records of paint use to show where too much paint was mixed for a job. Use the information to prevent overmixing in the future.

Reduce Overspray. In some cases, spray painting is the only practical choice in terms of time and money. Minimize the impact of spray painting by adopting the following recommendations.

- 👍 Conduct all spray painting on land, in a spray booth, or under a tarp.
- 👍 Use equipment with high transfer efficiency. Tools such as high-volume, low-pressure (HVLP) spray guns direct more paint onto the work surface than conventional spray guns. As a result, less paint is in the air, less volatile organic compounds are released, less paint is used, and clean up costs are reduced. Air-atomizer spray guns and gravity-feed guns are other types of highly efficient

spray equipment.

- 👍 Train staff to use spray painting equipment properly in order to reduce overspray and minimize the amount of paint per job.

Handle Solvents Carefully. Refer to Waste Containment and Disposal for further information about requirements for handling, storing, and transporting hazardous wastes.

- Store open containers of usable solvents as well as waste solvents, rags, and paints in covered, UL-listed, or Factory Mutual approved containers.
- Hire a licensed waste hauler to recycle or dispose of used solvents.
- 👍 Direct solvent used to clean spray equipment into containers to prevent evaporation of volatile organic compounds. A closed gun cleaning system will save you money on cleaning materials.
- 👍 Use only one cleaning solvent to simplify disposal.
- 👍 Use only the minimal amount of solvent (stripper, thinner, etc.) needed for a given job.
- 👍 For small jobs, pour the needed solvent into a small container in order not to contaminate a large amount of solvent.
- ✓ Use soy-based solvents and other similar products with no or low volatility.
- ✓ Order your spray painting jobs to minimize coating changes. Fewer changes mean less frequent purging of the spray system. Order your work light to dark.
- ✓ Allow solids to settle out of used strippers and thinners so you can reuse solvents.
- ✓ Keep records of solvent and paint usage so you have a handle on the amount of hazardous waste generated on site.

Arrange spray-painting jobs to minimize color changes. Order your work from light to dark. Fewer changes mean less frequent purging of the spray system.

Repair and Maintain Engines with Care.

- 👍 Store engines and engine parts under cover on an impervious surface like asphalt or concrete.
- 👍 Do not wash engine parts over the bare ground or water.
- 👍 Use dry precleaning methods, such as wire brushing,
- 👍 Avoid unnecessary parts cleaning.
- ✓ Adopt alternatives to solvent-based parts washers such as bioremediating systems that take advantage of microbes to digest petroleum. Bioremediating systems are self contained; there is no effluent. The cleaning fluid is a mixture of detergent and water. Microbes are added periodically to "eat" the hydrocarbons.
- 👍 If you use a solvent to clean engine parts, do so in a container or parts washer with a lid to prevent evaporation of volatile organic compounds. Reuse the solvent. Once the solvent is totally spent, recycle it.
- 👍 Use drip pans when handling any type of liquid. Use separate drip pans for each fluid to avoid mixing. Recycle the collected fluid. Use funnels to transfer fluids.
- 👍 Drain all parts of fluids prior to disposal.
- 👍 Clean engine repair areas regularly using dry cleanup methods, *e.g.*, capture petroleum spills with oil absorbent pads.

- Prohibit the practice of hosing down the shop floor.

Winterize Safely.

- Use propylene glycol antifreeze for all systems. It is much less toxic than ethylene glycol antifreeze.
- Use the minimum amount of antifreeze necessary for the job.
- For health reasons, ethylene glycol should never be used in potable water systems; it is highly toxic and cannot be reliably purged come springtime.
- Add stabilizers to fuel to prevent degradation. Stabilizers are available for gasoline and diesel fuels and for crankcase oil. These products protect engines by preventing corrosion and the formation of sludge, gum, and varnish. Also, the problem of disposing of stale fuel in spring is eliminated.
- Be sure fuel tanks are 85-90 percent full to prevent flammable fumes from accumulating and to minimize the possibility of condensation leading to corrosion. Do not fill the tank more than 90% full. The fuel will expand as it warms in the springtime; fuel will spill out the vent line of a full tank.
- Use the highest rated octane recommended by the engine manufacturer; premium fuels are more stable than regular.
- Be sure the gas cap seals tightly.
- Promote reusable canvas or recyclable plastic covers. Some manufacturers will clean and store canvas covers during the boating season.
- Recycle used plastic covers.

Prohibit underwater hull cleaning. Underwater cleaning is dangerous to divers and heavy metals released are toxic to aquatic life. Offer incentives like mid-season haul out rates for hull cleaning.

Conduct In-Water Maintenance Wisely.

- If the impacts of cleaning or maintenance activities (regardless of area involved) cannot be contained or mitigated against, remove the boat from the water. No debris should be allowed to fall into the water.
- Keep containers of cleaning and maintenance products closed.
- Restrict or prohibit sanding on the water. When it is absolutely necessary to sand on the water, use vacuum sanders to prevent dust from failing into the water. Do not sand in a heavy breeze.
- Plug scuppers to contain dust and debris.
- Do not spray paint on the water.
- Prohibit underwater hull cleaning in your facility. Given the concentration of boats, underwater cleaning is dangerous to divers and the heavy metals that are released are harmful to aquatic life. Insurance to cover divers is also expensive.
- ✓ Offer incentives, like reduced mid-season haul out rates, so that boaters can have their hulls cleaned on land where contaminants may be contained.

Educate Boaters.

- Copy the following Clean Boating Tip Sheet and distribute it to your tenants. There is room to add the name and logo of your marina.
- Find out about local hazardous waste collection days by calling your local county health department. You can also call NJDEP's Recycling Hotline at 1-609-984-3438 or visit www.state.nj.us/dep/dshw/recycle/recycoor.htm for local recycling contacts. Post notices informing your tenants when and where they can take their hazardous wastes.

Clean Boating Tip Sheet

Vessel Cleaning and Maintenance

As a boater, you are well aware of the care your vessel requires. In order to keep your boat safe, reliable, and attractive, you must clean and maintain it. As you do so, minimize environmental impacts by following the recommendations listed here.

Caution is necessary because your choice of products and activities can have serious impacts on water quality and aquatic life. For example, if paint chips from a hull are not contained, they may end up in the water. The heavy metals in the paint chips may then be consumed by mussels, worms, and other bottom-dwelling creatures and passed up the food chain to fish, birds, and humans.

Clean Carefully

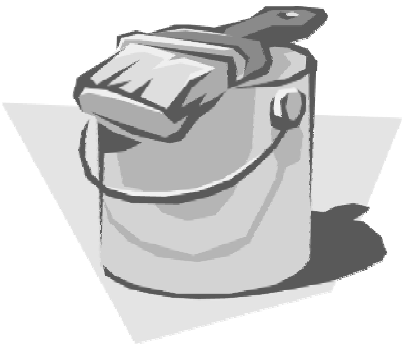
- Wash frequently with a sponge or nonabrasive pad and plain water. This approach is very effective at removing salt. Additional "elbow-grease" is required to remove stains.
- When detergents are necessary, use soaps that are phosphate-free, biodegradable, and non-toxic. Any soap should be used sparingly because even non-toxic products can be harmful to wildlife. For example, detergents will destroy the natural oils on fish gills, limiting their ability to breathe.
- Wax your boat, if appropriate. A good coat of wax prevents surface dirt from becoming ingrained.
- Clean teak with a mild soap and abrasive pads or bronze wool. This method is safe for the environment and better for the boat than the solvents in standard teak cleaners which tend to eat away at the wood and to damage seam compounds.
- Avoid detergents that contain ammonia, sodium hypochlorite, chlorinated solvents (bleach), petroleum distillates, and lye.
- Try some of the alternative cleaning products listed on the reverse side of this page.

Maintain Mindfully

- Collect all paint chips, dust, and residue. Dispose in regular trash.
- Share leftover paint and varnish.
- Use less toxic propylene glycol antifreeze.
- Avoid overkill. Select a bottom paint developed for the mid-Atlantic region.

Recycle Regularly

- Recycle used oil, oil filters, and antifreeze.
- Bring used solvents and waste gasoline to local hazardous waste collection days.
- Visit the New Jersey Department of Environmental Protection's web page at www.state.nj.us/dep/dshw/recycle/recycoor.htm for local recycling (recycling hotline 609-984-3438) and hazardous waste (hazardous waste hotline 609-292-8341) contacts.



Be a Conscientious Consumer

- Read product labels. Labels convey information about the degree of hazard associated with a particular product. For example, DANGER equates to extremely flammable, corrosive or toxic; WARNING indicates that the material is moderately hazardous, and CAUTION signals a less hazardous product. Select products that contain no warnings or which merely CAUTION consumers.
- Be wary of unqualified general claims of environmental benefit, *e.g.*, "ozone friendly." A better, more meaningful label would read, "This product is 95 percent less damaging to the ozone layer than past formulations that contained chlorofluorocarbons (CFCs)."
- For additional information about environmentally responsible products, contact Green Seal. Green Seal is an independent, nonprofit organization that sets environmental standards for consumer goods. Products that meet their criteria are awarded a "Green Seal of Approval." You may search Green Seal's database of Green Seal-certified, environmentally responsible products at www.greenseal.org or call (202) 872-6400.

Alternatives to Toxic Products

While baking soda, vinegar, lemon juice, and vegetable oils are far less harmful than bleaches, scouring powders or detergents, they are still toxic to marine life. Use cleaning products sparingly and minimize the amount discharged into the water. Never dispose of any cleaning products down the thru-hull drain; dispose of them on shore.

Product	***Alternative***
Bleach	Borax
Detergent & Soap	Elbow grease
Scouring Powders	Baking soda. Or rub area with one-half lemon dipped in borax, then rinse
General Cleaner	Baking soda and vinegar. Or lemon juice combined with borax paste
Floor Cleaner	One cup vinegar + 2 gallons of water
Window Cleaner	One cup vinegar + 1 quart of warm water. Rinse and squeegee
Aluminum Cleaner	2 Tbsp. cream of tartar + 1 qt. of hot water
Brass Cleaner	Worcestershire sauce. Or paste made of equal amounts of salt, vinegar, and water
Copper Cleaner	Lemon juice and water. Or paste of lemon juice, salt, and flour
Chrome Cleaner/Polish	Apple cider vinegar to clean; baby oil to polish
Stainless Steel Cleaner	Baking soda or mineral oil for polishing, vinegar to remove spots
Fiberglass Stain Remover	Baking soda paste
Mildew Remover	Paste with equal amounts of lemon juice and salt, or white vinegar and salt
Drain Opener	Dissemble or use plumber's snake. Or flush with boiling water + one-quarter cup baking soda + one-quarter cup vinegar
Wood Polish	Olive or almond oil (interior walls only)
Hand Cleaner	Baby oil or margarine
Head & Shower	Baking soda; brush thoroughly
Rug/Upholstery	Dry corn starch sprinkled on; vacuum

Adapted from Buller, Pat. 1995. *Clean Marina +Clean Boating +Clean Water Partnership*. Seattle, WA: Puget Soundkeeper Alliance.

Manasquan
Watershed
Management
Group
(732)542-3630

Petroleum Control

Environmental Concerns

Legal Setting

- Federal Water Pollution Control Act
- New Jersey State Law

Best Management Practices for Prevention Spills at the Source

- Protect Petroleum Storage Tanks
- Avoid Waves and Wakes
- Maintain Transfer Equipment
- Install Environmental Controls at the Pump
- Supervise Fueling: Environmental Recommendations
- Supervise Fueling: Safety Recommendations
- Turn Down the Pressure
- Advocate the Use of Oil Absorbent Materials
- Provide an Oil/Water Separator
- Offer Spill-Proof Oil Changes
- Minimize Spills and Leaks from Machinery
- Educate Boaters

Best Management Practices for Emergency Planning

- Prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan
- Assess Hazards
- Develop Emergency Response Plans
- Make Plans Accessible
- Train Employees
- Share Your Emergency Response Plans
- Maintain Oil Spill Response Equipment
- Store Oil Response Equipment Smartly
- Be Prepared for a Fire
- Maintain Material Safety Data Sheets

Clean Boating Tip Sheet: Petroleum Control

Petroleum Control

Environmental Concerns

Petroleum in or on the water is harmful and, in some cases, fatal to aquatic life. Benzene, a carcinogen, is in gasoline. Oil contains zinc, sulfur, and phosphorous.

Once petroleum is introduced into the water, it may float at the surface, evaporate into the air, become suspended in the water column, or settle to the sea floor. Floating petroleum is particularly noxious because it reduces light penetration and the exchange of oxygen at the water's surface. Floating oil also contaminates the *microlayer*. The microlayer refers to the uppermost portion of the water column. It is home to thousands of species of plants, animals, and microbes. Ninety-nine percent of blue crab larvae feed in the microlayer which also serves as a nursery ground for rockfish (Hardy 1991). The abundance of life in the microlayer attracts predators: seabirds from above and fish from below. Pollution in the microlayer, thus, has the potential to poison much of the aquatic food web.

Legal Setting

Federal Water Pollution Control Act (Clean Water Act)

Because of the harm associated with petroleum, the discharge of oil is absolutely prohibited. The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000.

The United States Coast Guard must be notified any time a spill produces a sheen on the water. Call the National Response Center at 1-800-424-8802. Report the location, source, size, color, substance, and time of the spill. Failure to report a spill may result in fines.

The Clean Water Act (33 CFR 153.305) also prohibits the use of soaps or other dispersing agents to dissipate oil on the water or in the bilge without the permission of the Coast Guard. Soaps, emulsifiers, and dispersants cause the petroleum to sink in the water column and mix with sediments where they will remain for years. Also, the soaps themselves are pollutants. You may be fined up to $25,000 per incident for the unauthorized use of soap or other dispersing agents on the water or in the bilge.

New Jersey State Law

The discharge of oil is prohibited by State law. New Jersey's Spill Compensation and Control Act (N.J.S.A 58:10-23.11) states:

> The Legislature finds and declares that the discharge of petroleum products and other hazardous substances within or outside the jurisdiction of this State constitutes a threat to the economy and environment of this State. The Legislature intends by the passage of this act to exercise the powers of this State to control the transfer and storage of hazardous substances and to provide liability for damage sustained within this State as a result of any discharge of said substances, by requiring the prompt containment and removal of such pollution and substances, and to provide a fund for swift and adequate compensation to resort businesses and other persons damaged by such discharges, and to provide for the defense and indemnification of certain persons under contract with the State for claims or actions resulting from the provision of services or work to mitigate or clean up a release or discharge of hazardous substances.

All spills must be reported immediately to the New Jersey Department of Environmental Protection at 1-877-WARN DEP and your county health department.

Report all spills immediately to the New Jersey Department of Environmental Protection at 1-877-WARN DEP, the U.S. Coast Guard, and your county health department.

Best Management Practices for Preventing Spills at the Source

Protect Petroleum Storage Tanks. Fuel storage tanks at marinas typically hold from 1,000 to 10,000 gallons of fuel. If a tank was to rupture or develop a leak, the consequences could be devastating.

- ✓ Install double-walled or vaulted above ground fuel tanks. Tanks should meet the following conditions (NFPA 30).
  a. The capacity of the tank shall not exceed 12,000 gal (45,420 L).
  b. All piping connections to the tank shall be made above the normal maximum liquid level.
  c. Means shall be provided to prevent the release of liquid from the tank by siphon flow.
  d. Means shall be provided for determining the level of the liquid in the tank. This means shall be accessible to the delivery operator.
  e. Means shall be provided to prevent overfilling by sounding an alarm when the liquid level in the tank reaches 90 percent of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity. In no case shall these provisions restrict or interfere with the proper functioning of the normal or emergency vent.
  f. Spacing between adjacent tanks shall be not less than 3 ft. (0.9 m).

g. The tank shall be capable of resisting the damage from impact of a motor vehicle or suitable collision barriers shall be provided.
h. Where the interstitial space is enclosed, it shall be provided with emergency venting.

✓ Alternatively, locate above ground fuel tanks within a dike or over an impervious storage area with containment volumes equal to 1.1 times the capacity of the storage tank(s). Design containment areas with spigots to drain collected materials. If possible, cover the tank with a roof to prevent rainwater from filling the containment area. The control of any stormwater that collects in the diked area must be addressed as a condition of your General Permit for Discharges from Marinas.

γ All existing Underground Oil Storage Tanks (USTS) were to be upgraded by December 1998 to include corrosion protection and spill and overfill prevention equipment. (N.J.A.C. 7:14B). Double walled and piping tanks do not require an NJDEP permit. Applicant only needs local permit and inspection.

γ All new USTs must include corrosion protection and spill and overfill prevention equipment such as a high level alarm or restrictor valve. (N.J.A.C. 7:14B).

γ Install a leak detection system on all new and existing USTs (N.J.A.C.7:14B).

γ Install a readily accessible shut-off valve on shore to halt, when necessary, the flow of fuel through a pipeline from the oil storage facility to a wharf pier, or dock.

γ All motor fuel USTs must meet Federal financial responsibility requirements *(i.e.*, insurance) for environmental pollution liability.

👍 Contact the New Jersey Department of Environmental Protection's Bureau of Underground Storage Tanks for guidance documents on the installation of fuel tanks. All underground storage tanks must be registered with NJDEP.

Avoid Waves and Wakes.

👍 Locate fuel docks in areas protected from wave action and boat wakes when constructing new or upgrading existing facilities. For safety reasons, all fueling stations should be accessible by boat without entering or passing through the main berthing area.

✓ Provide a stable platform for fueling personal watercraft (PWC). You may purchase prefabricated drive-on docks or modify an existing dock by cutting a v-shaped berth and covering it with outdoor carpeting. Consider placing the PWC fueling area at the end of the fuel pier to reduce conflict with larger boats.

Maintain Fuel Transfer Equipment.

👍 Inspect transfer equipment regularly and fix all leaks immediately.

👍 Maintain transfer equipment and hoses in good working order. Replace hoses, pipes, and tanks before they leak.

👍 Hard connect delivery nozzles.

- Hang nozzles vertically when not in use so that fuel remaining in hoses does not drain out.

Install Environmental Controls at the Pumps.

- γ Do not install holding clips. The use of holding clips to keep fuel nozzles open is illegal at marina fuel docks.
- Install automatic back pressure shut-off nozzles on fuel pump discharge hoses to automatically stop the flow of fuel into a boat's fuel tank when sufficient reverse pressure is created.
- ✓ Consider installing fuel nozzles that redirect blow-back into vessels' fuel tanks or vent attachments that capture fuel overflow.
- Maintain a supply of oil absorbent pads and pillows at the fuel dock to mop up spills on the dock and on the water.
- Place plastic or nonferrous drip trays lined with oil absorbent material beneath fuel connections at the dock to prevent fuel leakage from reaching the water.
- Post instructions at the fuel dock directing staff and patrons to immediately remove spilled fuel from the dock and water with oil absorbent material. Indicate the location of the absorbents.
- Place small gas cans in oil absorbent-lined drip pans when filling.
- ✓ Secure oil-absorbent material at the waterline of fuel docks to quickly capture small spills. Look for oil absorbent booms that are sturdy enough to stand up to regular contact with the dock and boats.
- ✓ Offer your service to install fuel/air separators on boats.

Maintain a supply of oil absorbent pads and pillows at the fuel dock to clean spills on the dock and in the water.

Supervise Fueling: Environmental Recommendations.

- Always have a trained employee at the fuel dock to oversee or assist with fueling.
- Train employees to clarify what the boater is asking for. For example, as your employee passes the fuel nozzle to the boater, have him or her say, “This is gasoline. You asked for gasoline.”
- Train employees to hand boaters oil absorbent pads with the fuel nozzle. Request that the boaters use them to capture backsplash and vent line overflow.
- Attach a container to the external vent fitting to collect overflow. There are products on the market that may be attached to the hull with suction cups. A rubber seal on the container fits over the fuel vent allowing the overflow to enter the container. Fuel captured in this manner can be added to the next boat to fuel.
- Instruct fuel dock personnel and boaters to listen to filler pipes to anticipate when tanks are nearly full.
- Encourage boaters to fill their fuel tanks just before leaving on a trip to reduce spillage due to thermal expansion and rocking, *i.e.*, if the fuel is used before it warms up, it cannot spill overboard.
- If boaters prefer to refuel upon their return to port, encourage them to fill their tanks to no more than 90 percent of capacity.
- Instruct boaters to slow down at the beginning and end of fueling.
- Require boaters to stay with their craft during fueling.

Supervise Fueling: Safety Recommendations.

- Always have a trained employee at the fuel dock to oversee or assist with fueling.
- Remind boaters that gasoline vapors are heavier than air; they will settle in a boat's lower areas.
- Require all passengers to get off gasoline powered vessels before fueling.
- Instruct boaters to:
  - Stop all engines and auxiliaries
  - Shut off all electricity, open flames, and heat sources
  - Extinguish all cigarettes, cigars, and pipes
  - Close all doors, hatches, and ports
  - Maintain nozzle contact with the fill pipe to prevent static spark
  - Inspect bilge after fueling for leakage or fuel odors
  - Ventilate all compartments after fueling until fumes are gone
- Train dock staff to carefully observe fueling practices; make sure fuel is not accidentally put into the holding tank, water tank, or rod holder.

Box 2: Oil Absorbent Material

Oil absorbent pads, booms, and pillows absorb hydrocarbons and repel water. Depending upon the type, they may hold up to 25 times their weight in oil. These types of products are useful for capturing spurts at the fuel dock, cleansing bilge water, and wiping up spills in engine maintenance areas.

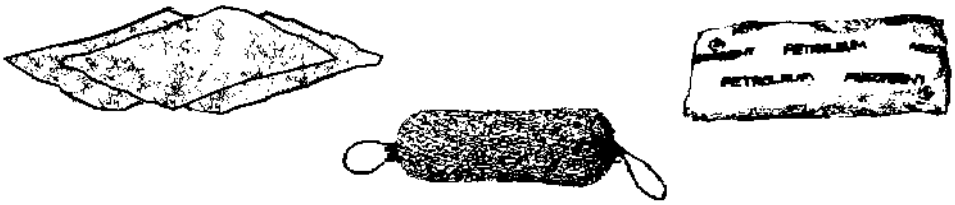
There are a number of new twists on basic oil absorbent materials. One new variety of oil absorbent boom captures oil from the bilge and solidifies into a hard rubber bumper. Other types contain microbes that digest the petroleum. The oil is converted to carbon dioxide and water. Because the microbes take 2 to 3 weeks to digest a given input of oil, it is not appropriate to use these types of products for a spill of any significant size. Rather, they are designed to control the minor drips associated with routine operations. Care must still be taken that free floating oil is not discharged overboard.

Yet another type of oil absorbent product is a boom constructed out of oil absorbent polypropylene fabric and filled with dehydrated microbes. These booms hold the petroleum in the fabric until it is digested by microbes. Threats associated with free floating petroleum are thereby minimized.

How you dispose of used oil absorbent material depends on what type of product it is and how it was used:

- Standard absorbents that are saturated with gasoline may be air dried and reused.
- Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Alternatively, they should be double bagged - one plastic bag sealed inside of another - and tossed in your regular trash.

- Bioremediating bilge booms may be disposed in your regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.



Oil absorbent materials, such as pads (left), booms (center), and pillows (right) absorb up to 25 times their weight in oil while repelling water.

Turn Down the Pressure. Problems with backsplash and vent-line overflow are often due to the high pressure flow of fuel from the pump.

✓ Ask your fuel company representative to set the delivery rate to 10 gallons per minute, especially if you cater to small boats.

Prevent oil spills – rent non-spill oil pump systems to boaters to draw crankcase oils out through dipstick tube.

Advocate the Use of Oil Absorbent Materials.

👍 Distribute pads, pillows, or booms to your tenants.

✓ Require tenants to use oil absorbent materials as part of your lease agreement.

Provide an Oil/Water Separator.

✓ Invest in a portable or stationary oil/water separator to draw contaminated water from bilges, capture hydrocarbons in a filter, and discharge clean water.

Offer Spill-Proof Oil Changes.

👍 Purchase a non-spill pump system to draw crankcase oils out through the dipstick tube. Use the system in the boat shop and rent it to boaters who perform their own oil changes.

👍 Slip a plastic bag over used oil filters prior to their removal to capture any drips. Hot drain the filter by punching a hole in the dome end and draining for 24 hours. Recycle the collected oil. Recycle the metal canister if practical. If not, dispose in your regular trash.

👍 Change oil when engine is cold to prevent leakage when removing the filter.

✓ Encourage the use of spill-proof oil change equipment as a condition of your slip rental agreement.

Minimize Spills and Leaks from Machinery.

👍 Use non-water-soluble grease on Travelifts, fork lifts, cranes, and winches.

✓ Place containment berms with containment volumes equal to 1.1 times the capacity of the fuel tank around fixed pieces of machinery that use oil and gas. The machinery should be placed on an impervious pad. Design containment areas with spigots to drain collected materials. Dispose of all collected material appropriately. Refer to the *Waste Containment and Disposal* section of this guidebook. If possible, cover the machinery with a roof to prevent rainwater from filling the containment area.

✓ Place leak-proof drip pans beneath machinery. Empty the pans regularly, being conscientious to dispose of the material properly (uncontaminated oil and antifreeze may be recycled).
✓ Place oil-absorbent pads under machinery.

Educate Boaters.

👍 Photocopy the Clean Boating Tip Sheet included at the end of this chapter and distribute it to your tenants. There is room to add your marina's name and logo.

Best Management Practices for Emergency Planning

Prepare a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

γ The Environmental Protection Agency's Oil Pollution Prevention Regulation requires that marinas prepare and implement a plan to prevent any discharge of oil into navigable waters or adjoining shorelines if the facility:
- has an above ground oil storage capacity greater than 660 gallons in a single container,
- an aggregate above ground storage capacity greater than 1,320 gallons, or
- a total underground storage capacity greater than 42,000 gallons.

Oil is defined in the SPCC regulations (40 CFR 112) as "oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil and oily mixtures."

γ The plan must address:
- operating procedures implemented by the facility to prevent oil spills,
- control measures installed to prevent a spill from entering navigable waters or adjoining shorelines, and
- countermeasures to contain, cleanup, and mitigate the effects of an oil spill that impacts navigable waters or adjoining shorelines.

γ The SPCC plan must be certified by a professional engineer and kept onsite for EPA review. If a single spill of greater than 1,000 gallons occurs or two discharges of harmful quantity occur within one year, a copy of the SPCC plan must be submitted to EPA Region II.

Assess Hazards.

👍 Consider and plan for likely threats:
- fuel spill
- holding or water tank filled with gas
- spill at the storage area: used oil, antifreeze, solvents, etc.
- fire
- health emergency
- hurricane, etc.

Develop Emergency Response Plans.

- Develop written procedures describing actions to be taken under given circumstances. The plans should be clear, concise, and easy to use during an emergency, *e.g.*, use a large type size. Each emergency response plan should contain the following information:

  Where:
  - In the very front of the plan, insert a laminated 11 by 17 inch site plan of the facility showing valves, pipes, tanks, structures, roads, hydrants, docks, power and fuel shutoffs, hazardous material storage locations, and telephones.
  - Describe where response material is located.

  Who:
  - Identify who is responsible for taking what action, *e.g.*, deploying equipment, contacting emergency agencies, etc.
  - Designate one person on the marina staff as the official spokesperson for the facility.
  - Include a list of emergency phone numbers: U.S. Coast Guard's National Response Center (800) 424-8802, NJDEP's Emergency Hotline 1-877 WARN DEP, county health department, local fire and police departments, owner, and neighboring marinas that have emergency response equipment.
  - Include a brief description of each agency's jurisdiction and information about what type of equipment and services are available from neighboring marinas and spill response firms.

  What:
  - State what action should be taken during an emergency and, based on likely threats, what equipment should be deployed. Include information about what type of equipment is available on site and what its characteristics and capabilities are.
  - Characterize the facility's waterfront and vessels.
  - Describe the type, amount, and location of materials stored on site, *e.g.*, petroleum and hazardous materials.

  How:
  - Explain how the equipment should be used and disposed.

  When:
  - Indicate when additional resources should be called for assistance.
- Update the plans annually to include any new technology or equipment and to confirm phone numbers.

Make Plans Accessible.

- Keep copies of all Emergency Response Plans in a readily accessible location.
- Place a second copy of the Oil Spill Response Plan (SPCC) in the oil spill response kit.

Post emergency phone numbers:

USCG Response Center (800) 424-8802

NJDEP Emergency Hotline 1-877-WARN DEP

Your County Health Department

Train Employees.

- 👍 Review plans and response procedures with staff at the beginning of each boating season.
- 👍 Train employees in the use of containment measures.
- 👍 Run emergency response drills at least twice annually.
- ✓ Invite the U.S. Coast Guard and local fire department to demonstrate emergency response procedures at your marina.

Share Your Emergency Response Plans.

- 👍 Inform your local fire department and harbor master, if applicable, about your emergency response plans and equipment.
- ✓ Let neighboring marinas know what resources are available at your marina.

Maintain Oil Spill Response Equipment.

- 👍 Maintain enough oil spill response equipment to contain the greatest potential spill at your facility.
- 👍 Store enough boom to encircle the largest vessel in your facility. Vessel length x 3 = required length of boom.

Store Oil Spill Response Equipment Smartly.

- 👍 Store the equipment where the greatest threat of an oil spill exists: fuel receiving and fuel dispensing areas.
- 👍 Store materials in an enclosed container or bin that is accessible to all staff-especially those who handle the fueling operations.
- 👍 Mark the storage site with a sign reading "Oil Spill Response Kit." Include instructions for deploying pads and booms and notification that all spills must be reported to the USCG at (800) 424-8802, NJDEP at 1-877 WARN DEP, and county health department.
- ✓ Consider leaving the storage container unlocked so that it is available to patrons, as well as to staff. If leaving the bin unlocked at all times is not palatable, try leaving it unlocked just on weekends and holidays when both activity and risk are greatest.
- ✓ If the bin is left unlocked, check the inventory regularly.

Box 3. Fuel Spill

What do you do when oil, gas, or diesel is spilled?
1. Stop the flow.
2. Contain the spill.
3. Call the U.S. Coast Guard's National Response Center at (800) 424-8802, New Jersey Department of Environmental Protection's Discharge Response Unit at 1-877-WARN DEP, and the local county health department.

Failure to report spills to the Coast Guard may result in civil penalties.

If less than a gallon is spilled and you clean it up immediately, the Coast Guard will probably not send anybody to your facility. The spill is still a violation, however.

Call the Coast Guard if a slick floats into your marina from an unknown source. The Coast Guard will clean up the spill with their own resources. They will also investigate and try to eliminate the source of the spill. You will not be held liable for a slick that did not originate at your facility.

Be Prepared for a Fire.

- Meet the National Fire Protection Association's standards for marinas: NFPA 303, Fire Protection Standards for Marinas and Boatyards; NFPA 302, Fire Protection Standards for Pleasure and Commercial Motor Craft; NFPA 30A, Automotive and Marine Service Station Code; NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves; and NFPA 33, Standard for Spray Application Using Flammable and Combustible Materials.
- Be sure hydrants are available to allow for fighting fires throughout your facility.
- Install smoke detectors.
- Provide and maintain adequate, readily accessible, and clearly marked fire extinguishers throughout the marina, especially near fueling stations.
- Inspect and test all fire fighting equipment and systems regularly. Test fire extinguishers annually.
- Train personnel on fire safety and response: who to call, location of hydrants, use of portable extinguisher, etc.
- Provide ready access to all piers, floats, and wharves for municipal fire fighting equipment.
- ✓ Invite the local fire marshal to visit your marina annually to train employees. These annual visits will also help the fire department to become familiar with your facility.

Maintain Material Safety Data Sheets.

- γ Keep a file of Material Safety Data Sheets (MSDS) for all products used at your facility, as required by the Occupational Safety and Health Act of 1970 (29 USC Sec. 657). Store the file in an office away from material storage areas. Keep in

mind during an emergency that this file will not tell you what quantity is on site or even whether all the materials listed are present.

- Inform the local Emergency Planning Committee what materials you store and what is released when they burn.

Clean Boating Tip Sheet

Petroleum Control

Petroleum in or on the water is harmful and, in some cases, fatal to aquatic life. Floating petroleum is particularly bad because it reduces light penetration and the exchange of oxygen at the water's surface. Floating oil also contaminates the microlayer. The microlayer refers to the uppermost portion of the water column. It is home to thousands of species of plants, animals, and microbes. Ninety-nine percent of blue crab larvae feed in the microlayer which also serves as a nursery ground for striped bass. The abundance of life in the microlayer attracts predators: seabirds from above and fish from below, Pollution in the microlayer, thus, has the potential to poison much of the aquatic food web.

The Law

The Federal Water Pollution Control Act (also called the Clean Water Act) prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000 from the U.S. Coast Guard. State law also prohibits the discharge of oil. The New Jersey Department of Environmental Protection may impose additional fines.

Fueling Practices

Gas or diesel may be spilled during the act of fueling: as backsplash out the fuel intake or as overflow out the vent fitting. Spills of this sort harm aquatic life, waste money, and can result in stains on the hull and damage to the gel coat and striping. Follow these tips to avoid problems:

- Fill tanks to no more than 90 percent capacity-gas that is drawn from cool storage tanks will expand as it warms up onboard your vessel.
- To determine when the tank is 90 percent full, listen to the filler pipe, use a sounding stick, and be aware of your tank's volume. Do not rely solely on the fuel gage to determine fullness.
- Rather than filling your tank upon your return to port, wait and fill it just before leaving on your next trip. This practice will reduce spills due to thermal expansion because the fuel will be used before it has a chance to warm up.
- Fill portable tanks ashore where spills are less likely to occur and easier to clean up.
- Use oil absorbent pads to catch all drips.
- Slow down at the beginning and end of fueling.

Bilge Maintenance

Engine oil tends to accumulate in bilges. If no precautions are taken, the oil is pumped overboard along with the bilge water. Discharging oily water is illegal. To avoid fines and to protect water quality, follow these tips:

- Keep your engine well tuned to minimize the amount of oil that is released. Be sure there are no leaking seals, gaskets, or hoses.
- Place oil absorbent materials or a bioremediating bilge boom in the bilge.
- Place an oil absorbent pad under the engine.
- Replace oil absorbent materials regularly.

- Look for contractors or marinas that offer a bilge pumpout service.
- Do not treat oily water with detergents. Soaps pollute and make clean up impossible. You may be fined up to $25,000 for using soaps to dissipate oil.

Disposal of Oil Absorbent Materials

The disposal of used oil absorbent material depends on what type of product it is and how it was used:

- Standard absorbents that are saturated with gasoline may be air dried and reused.
- Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Alternatively, they should be double bagged with one plastic bag sealed inside of another and tossed in your regular trash.
- Bioremediating bilge booms may be disposed in your regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.

Emissions Control

Marine engines-especially 2-stroke outboard motors-produce the highest average level of hydrocarbon exhaust emissions after lawn and garden equipment. Hydrocarbon emissions contribute to ground level ozone, a known health risk. Follow these tips to help your engine operate as efficiently as possible:

- Use the gas to oil ratio recommended by the engine manufacturer. Too much oil can foul spark plugs and too little can lead to increased engine wear or even failure. Use premium two-cycle engine oil (TC-W3 or TC-W4). Premium oils improve engine performance and reduce pollution because they burn cleaner, contain more detergents, and prevent formation of carbon deposits.
- Use gasoline with the octane level recommended by the engine manufacturer.

Preventive Equipment

Products are available commercially which can help you prevent spills and reduce emissions:

- Install a fuel/air separator along your vent line. These devices allow air, but not fuel, to escape through a vent opening.
- Attach a safety nozzle to portable gas cans used to fill outboard engines. These nozzles automatically stop the flow of fuel when the receiving tank is full.
- To prevent oily bilge water from being discharged, install a bilge pump switch that leaves an inch or two of water in the bilge. Alternatively, connect a bilge water filter to your vessel's bilge pump. Filters will remove oil, fuel, and other petroleum hydrocarbons from the water.
- When it is time to buy a new engine, select a fuel efficient, low emission model.

In Case of a Spill

- Stop the flow.
- Contain the spill.
- Call the U.S. Coast Guard National Response Center at (800) 424-8802.
- Call the New Jersey Department of Environmental Protection's Discharge Response Unit at 1-877-WARN DEP.
- Call the local county health department.

Manasquan Watershed Management Group
(732) 542-3630

Sewage Handling

Environmental Concerns

Legal Setting

- Marine Sanitation Devices
- Pumpout Stations
- No Discharge Areas

Best Management Practices to Control Sewage

- Install a Pumpout System
- Discourage Discharge from Type I and Type II MSDs at the Slip or Mooring
- Provide Shoreside Restrooms
- Design and Maintain Septic Systems to Protect Water Quality and Public Health
- Provide Facilities for Liveaboards
- Offer MSD Inspections
- Encourage Compliance
- Educate Boaters

Clean Boating Tip Sheet: Vessel Sewage

Sewage Handling

Environmental Concerns

Raw or poorly treated boat sewage is harmful to human health and water quality. Typhoid, hepatitis, cholera, gastroenteritis, and other waterborne diseases may be passed directly to people who swim in contaminated waters. People may also become infected by eating shellfish contaminated with viruses and other microorganisms contained in sewage discharge.

Sewage is also harmful to water quality. Because the microorganisms within sewage need oxygen, any effluent discharged to waterways reduces the amount of oxygen available to fish and other forms of aquatic life. Furthermore, the heavy nutrient load in sewage promotes excessive algal growth. As the algae multiply, they prevent life-giving sunlight from reaching subsurface vegetation. When the algae die they create another problem: the algae are decomposed by bacteria which further reduce levels of dissolved oxygen.

Legal Setting

Marine Sanitation Devices

For all of the reasons stated above, it is illegal to discharge raw sewage from a vessel within U.S. territorial waters, *i.e.*, anywhere other than three or more miles out into the open ocean. The Federal Clean Water Act and New Jersey's Marine Sewage Treatment Act (P.L. 1988, Chapter 117) requires that any vessel with an installed toilet be equipped with a certified Type I, Type II, or Type III marine sanitation device (MSD):

- *Type I* systems mechanically cut solids, disinfect the waste with chemical additive or with chlorine disassociated from salt water with an electronic jolt, and discharge the treated sewage overboard. The fecal coliform bacteria count of the effluent may be no greater than 1,000 per 100 milliliters and may not contain any floating solids.

- *Type II* systems are similar to Type I systems except that the Type IIs treat the sewage to a higher standard; effluent fecal coliform bacteria levels may not exceed 200 per 100 milliliters and total suspended solids may not be greater than 150 milligrams per liter. Type IIs also require more space and have greater operating energy requirements.

- *Type III* systems do not allow sewage to be discharged. The most common form of a Type III system is a holding tank. Other forms include recirculating and incinerating systems.

Vessels 65 feet and under may have any of the three types of MSDS. Vessels over 65 feet must have a Type II or III system. Additionally, Type I and Type II systems must display a certification label affixed by the manufacturer. A certification label is not required on Type III systems.

State law prohibits the discharge of sewage in "No Discharge" zones. No Discharge zones are proposed by the State and approved or "designated" by the U.S. Environmental Protection Agency. Vessels with an installed toilet typically have a "Y" valve or other means to bypass the sanitation system. Within the State's No Discharge Zones, all pathways for over-board discharge of raw sewage must be secured. The "Y" valve may be secured with a padlock or a non-reusable nylon tie known as a wire tie. Alternatively, the valve handle can be moved to the closed position and removed.

It should be noted that MSD requirements do not apply to vessels with portable toilets. Portable toilets should be properly emptied on shore. Remember, it is illegal to discharge raw sewage to any State waterway. Most pumpout facilities have wand attachments to empty portable toilets. Some marinas have portable toilet dump stations. Ask your marina operator how to dispose of waste from portable toilets.

It is illegal to discharge boat sewage in "No Discharge Zones." The following areas are classified as "No Discharge Zones":
Hudson River
Navesink River
Shrewsbury River
Shark River
Manasquan River

Barnegat Bay is proposed as a "No Discharge Zone."

Pumpout Stations

- The New Jersey Marine Sewage Treatment Act of 1988 requires all publicly owned or operated marinas, which accommodate vessels equipped with marine sanitation devices are to provide sewage pumpout facilities and portable toilet emptying receptacles.

- Installation of a pumpout system is required for new or expanding marinas as a condition of receiving a waterfront development permit from the New Jersey Department of Environmental Protection. NJDEP has been requiring MSD pumpout facilities as a condition of approval for new or expanded marinas of 10 or more slips since February 6, 1986.

No Discharge Areas

A No Discharge Area (NDA) is an area of water that requires greater environmental protection and where even treated sewage may not be discharged from a boat. When operating in a NDA, Type I and Type II systems must be secured to prevent discharge. All freshwater lakes, reservoirs, and rivers not capable of interstate vessel traffic are defined by the Federal Clean Water Act as No Discharge Areas. States, with the approval of the U.S. Environmental Protection Agency, may establish NDAs in other State waters. As New Jersey continues its efforts to clean up State waters, certain areas may be considered for NDA designation. The following rivers are classified as NDAs: Hudson River, Navesink River, Shrewsbury River, Shark River, and Manasquan River. Barnegat Bay is proposed as a NDA.

Best Management Practices to Control Sewage

Install a Pumpout System. Help boaters to meet the requirements of the law by providing a convenient, reliable marine sewage disposal facility, *i.e.*, a pumpout station. You, as a marina operator, may benefit from the installation of a pumpout in several ways. The presence of the pumpout facility promotes a public perception that you are environmentally responsible. More tangibly, the need for holding tanks to be pumped out regularly will draw a steady stream of customers to your dock. Each arriving vessel represents an opportunity to sell fuel, hardware, repair services, etc.

Any public or private marina is eligible to apply for up to $18,000 in grant funds to install a pumpout station. If more than $18,000 is needed, applications must be approved by the Clean Vessel Act Steering Committee. Currently, grant funds are not available for repair and maintenance of existing pumpout equipment. To apply for a Pumpout Station Grant, contact the Marine Trades Association at 732-206-1400 for an application. The application will then be reviewed for completeness by the Marine Trades Association and forwarded to NJDEP for funding. Please be aware that the grants are strictly reimbursable. You must pay for the equipment and installation up front. The Department will then reimburse you for pre-approved expenses.

In exchange for grant funding, marina owners agree to maintain pumpout systems in operating condition for a minimum of 5 years and agree not to charge more than $5 per pumpout. The pumpout system must be able to accept waste from portable toilets as well as from holding tanks and must be available to the general public during reasonable business hours. Although most marinas choose to use grant funding, there is no requirement to do so.

Once you have decided to invest in a pumpout system, consider the following recommendations.

- *Select an Appropriate System*. Select a system that best meets the needs of your clients and that can move the expected volume of sewage over the required distance. Ask the manufacturer for a written assurance that their system will operate effectively given the specific conditions at your marina.
  There are several types of pumpout systems available:
  - systems permanently fixed to a dock,
  - mobile systems mounted on a golf cart or hand truck,
  - direct slipside connections, and
  - pumpout boats.

Please note that grant funding is not available for direct slipside connections as these types of systems generally are not available for public use. Also, grant funding for pumpout boats is available only to government agencies.

- *Choose An Accessible Location*. Consider where the pumpout will be placed (if you select a fixed system). It should easily accommodate the types of boats that frequent your marina. Fuel docks are often good locations. Try to locate the pumpout system such that a vessel being pumped out does not prevent another boat from fueling.

- *Dispose of Collected Waste*. The best option for disposing of the collected waste is to connect directly to a public sewer line. If sewer is not available in your area, you will need a holding tank. The contents of the tank must be pumped periodically and trucked to a treatment plant.

- *Handle Collected Waste with Care*. For health reasons, workers should take precautions to avoid coming into direct contact with sewage. Workers should wear rubber gloves and respirators when maintaining or repairing MSDS.

- *Decide if the Pumpout will be Staffed*. It is a good idea to have an attendant operate the pumpout. Consider installing a buzzer or paging system so that boaters at the pumpout station can easily locate the attendant. If the station is unattended, be sure that clear instructions for use are posted.

- *Decide Whether a Fee Will be Charged*. If a fee is charged, how much will it be? Will tenants and liveaboards be charged? Or just transients? Remember, no more than $5 may be charged if grant funds were accepted for the purchase and/or installation of the system. If the pumpout system is not regularly staffed, you will have to make arrangements to collect the fee. Token systems have been used with success in many locations in other States.

- *Post Signs*. Provide information about use and cost of the pumpout station, hours of operation, and where to call for service if the system is out of order. Also, post signs that are visible from the channel so that passing boaters are aware of the facility. If you do not have a pumpout system, post directions to the closest public pumpout.

- *Maintain the Pumpout System.* You should inspect the system regularly and keep a log of your observations. Contact the pumpout manufacturer for specific maintenance and winterization recommendations. During the boating season, test the efficiency of the pump weekly by measuring the length of time required for the system to empty a 5-gallon bucket of water. In order to quickly address any malfunctions, establish a maintenance agreement with a contractor qualified to service and repair pumpout facilities. Some funding for maintenance and repair of pumpout systems may be available through the New Jersey Department of Environmental Protection. Contact the Division of Watershed Management at 609-984-0058 for more information.

Prevent potential problems with your pumpout system by timing it's efficiency. Test the system by pumping out a 5 gallon bucket. If, overtime, it becomes less efficient, repairs may be necessary.

- *Do Not Allow Waste to Drain Into Receiving Waters*. Do not allow rinse water or residual waste in the hoses to drain into receiving waters. Keep the pump running until it has been re-primed with clean water.

- *Educate Staff*. There have been incidents in which boaters were told that the pumpout system was broken when in fact it was not. Complaints have arisen about rude dockhands and inconvenient procedures. If boaters are going to use the pumpout systems, the experience must be as pleasant and convenient as possible. As the manager of a marina with a pumpout, you are demonstrating your commitment to clean water. It is imperative that your staff exhibit this same level of care.

Discourage Discharge from Type I and Type II MSDs at the Slip or Mooring. Effluent from legal Type I and Type II systems contain nutrients and possibly toxic chemicals. It probably contains pathogens as well. While many pass-through systems are capable of treating sewage to much higher levels, recall that the standard for Type I systems is a fecal coliform bacteria count of 1,000 per 100 milliliters. Bathing beaches are closed if fecal coliform counts exceed 200 fecal colonies per 100 milliliters. Thus, discharges from Type I and Type II systems in crowded, protected areas-such as marinas pose a real threat to human health and water quality. Adopt the following recommendations to discourage discharge within your facility.

- Prohibit discharge of head waste in your marina as a condition of your lease agreements.
- Post signs prohibiting the discharge of head waste and directing people to use shoreside restrooms.

Provide Shoreside Restrooms.

- Provide clean, functional restrooms to encourage people not to use their heads while in port.
- Make restrooms available 24 hours a day.
- Install a security system on restroom doors so people will feel safe using them, particularly late at night.
- ✓ Provide air conditioning and heating.

Design and Maintain Septic Systems to Protect Water Quality and Public Health. If you have a septic system, be alert for signs of trouble: wet areas or standing water above the absorption field, toilets that run slowly or back up, and odor. Septic failures can contaminate drinking water and shellfish. The following tips will help you to avoid the health risks and nuisance associated with an overburdened system (Miller and Eubanks 1992).

- Post signs in the restrooms informing patrons not to place paper towels, tissues, cigarette butts, disposable diapers, sanitary napkins or tampons in the toilets. These items can clog the septic system.

- Post signs in the laundry room encouraging patrons to use minimal amounts of detergents and bleaches.
- Do not dump solvents such as paint thinner or pesticides down the drain and post signs prohibiting customers from doing the same.
- Do not pour fats and oils down drains.
- Do not use a garbage disposal. Disposals increase the amount of solids entering the system. Capacity is reached more quickly. As a result, more frequent pumping is necessary.
- Use small amounts of drain cleaners, household cleaners, and other similar products.
- Do not use "starter enzyme" or yeast. These products can damage the system by causing the infiltration bed to become clogged with solids that have been flushed from the septic tank.
- Direct downspouts and runoff away from the septic field in order to avoid saturating the area with excess water. For stormwater management reasons, do not direct the flow toward paved areas.
- Do not compact the soil by driving or parking over the infiltration area.
- Hire a licensed professional to pump the tank every 2-5 years.

Provide Facilities for Liveaboards. Boaters who make their homes aboard vessels pose a tricky problem. It is not reasonable to expect that they will regularly untie in order to use a fixed pumpout facility. It is also unwise to assume that people living on their boats will always use shoreside restrooms. Furthermore, it is undesirable to allow a resident population to discharge Type I or II systems. Your obligation as marina owner/manager is to provide a convenient sewage disposal system for liveaboards while maintaining good water quality. Consider the following options to meet this challenge. Keep in mind that most liveaboards expect and are willing to pay a premium for extra service and more convenient slips.

- Provide a portable pumpout system or require that liveaboards contract with a mobile pumpout service.
- Reserve slips closest to shoreside restrooms for liveaboards. Be sure that the dock and route to the bathhouse are well lit at night.
- Stipulate in the lease agreement that vessels used as homes may not discharge any sewage.
- Offer to board their vessels and demonstrate the proper way to secure the "Y" valve.
- ✓ As a condition of the lease agreement, require that liveaboards place dye tablets in holding tanks to make any discharge clearly visible.
- ✓ Install direct sewer hookups for liveaboards.

Offer MSD Inspections.

- ✓ Service patrons' MSDs annually to ensure that their Type I and II systems are functioning properly.
- ✓ Encourage boaters to run dye tablets through their Type I or Type II systems outside of the marina. If a system is operating properly, no dye will be visible. Maintenance is required if dye can be seen in the discharge.

Encourage Compliance.

- Include information about MSD requirements and sewage laws in contracts for slips rentals, transients, and liveaboards.
- State that failure to comply with the MSD laws and marina policy will result in expulsion from the marina and forfeiture of fees. If a customer fails to observe the law or honor your contract: 1) discuss the matter with him or her, 2) mail a written notice asking that the offending practice stop immediately and keep a copy for your records, and 3) evict the boater.
- If a tenant is discharging raw sewage, report him or her to the local county health department. Provide as much information as possible: name of owner, vessel, location, date and time of last discharge, etc.

Educate boaters about the impacts of sewage and encourage them to properly maintain their MSDs. Provide copies of the* Clean Boating Tip Sheet *to your tenants.

Educate Boaters. As the generators and conveyors of sewage, boaters need to be educated about the impacts of sewage and its proper disposal. They must also be encouraged to properly maintain their MSDs and to purchase environmentally-friendly treatment products for their heads and holding tanks.

- Photocopy the following *Clean Boating Tip Sheet* and distribute it to your tenants. There is room to add your marina's name and logo.

Clean Boating Tip Sheet

Vessel Sewage

Is Sewage a Problem?

Raw or poorly treated boat sewage is harmful to human health and water quality. Typhoid, hepatitis, cholera, gastroenteritis, and other waterborne diseases may be passed directly to people who swim in contaminated waters. People may also become infected by eating shellfish contaminated with viruses and other microorganisms contained in sewage discharge.

Sewage is also harmful to water quality. Because the microorganisms within sewage need oxygen, any effluent discharged to waterways reduces the amount of oxygen available to fish and other forms of aquatic life. Furthermore, the heavy nutrient load in sewage promotes excessive algal growth. As the algae multiply, they prevent life-giving sunlight from reaching subsurface vegetation. When the algae die they create another problem; the algae are decomposed by bacteria which further reduce levels of dissolved oxygen.

What Does the Law Say?

According to Federal and State law, it is illegal to discharge raw sewage.

All vessels with installed toilets must have a Marine Sanitation Device (MSD):

- Type I systems mechanically cut solids and disinfect waste. They must bear a U.S. Coast Guard certification label.
- Type II systems are similar to Type I systems. The difference is that Type IIs treat sewage to a higher standard and generally require more space and energy. Type II systems must also have a Coast Guard certification label.
- Type III systems do not discharge sewage. Holding tanks are the most common Type III system. Incinerating systems are another option. A Coast Guard label is not required.

Vessels 65 feet and under may have any of these three types of MSDs. Vessels over 65 feet must have a Type II or III system.

What Can You Do?

Holding Tanks
Install a holding tank. Visit Maryland Department of Natural Resources' webpage at http://www.dnr.state.md.us/boating/pumpout/systemsguide/install.html to obtain information about installing a sewage holding tank.

Use good plumbing to control holding tank odor. Fiberglass and metal tanks are highly resistant to permeation. Specially labeled flexible "sanitation hoses" and PVC piping are also highly impermeable. Hose runs should be as short and as straight as possible. Wherever practical, use rigid pipe below the level of the holding tank and in other areas where sewage will accumulate. Keep the number of connections to a minimum and insure that seals are tight.

Use enzyme-based products in your holding tank to further control odor. Enzymatic products use biological processes, rather than harsh chemicals, to break down sewage. Be sure to pump and rinse your holding tank prior to initial use of an enzyme product if you have used chemical-based odor control additives in the past. Chemical residues may interfere with the effectiveness of enzyme-based products.

Avoid holding tank products that contain quaternary ammonium compounds (QACS) and formaldehyde. These products may disrupt sewage treatment plants.

Type I and II MSDs

Maintain your Type I or II MSD. Establish a regular maintenance schedule based on your owner's manual to remind yourself when chemicals need to be added, electrodes need to be cleaned, etc.

Do not discharge your Type I or II MSD while in a marina, in a swimming area, over an oyster bar, or in a poorly flushed area. Effluent from legal Type I and Type II systems contains nutrients and possibly toxic chemicals. It may contain pathogens as well.

Use shoreside restrooms when in port.

Manasquan
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Waste Containment and Disposal

Environmental Concerns

Legal Setting

- Marine Plastic Pollution Research and Control Act
- Resource Conservation and Recovery Act and State Hazardous Waste Laws

Best Management Practices to Properly Contain and Dispose of Waste

- Reduce Waste
- Control the Disposal of Fish Waste
- Manage Trash
- Recycle Whenever Possible
- Recycle Solid Waste
- Recycle Liquid Waste
- Minimize Your Use of Hazardous Products
- Store Solvents and Hazardous Materials with Care
- Follow Recommended Disposal Methods
- Track Pollution Incidents
- Educate Boaters

Pollution Report and Action Log

Clean Boating Tip Sheet: Waste Containment and Disposal

Waste Containment and Disposal

Environmental Concerns

All marinas generate some waste; waste that could threaten human health, be hazardous to wildlife, and be costly to coastal communities.

Solid waste, particularly plastics, must be contained. There are many well-documented instances of marine mammals, fish, turtles, and seabirds that have become entangled in or choked on plastic marine debris. Plastics also represent a hazard to navigation as they can snare propellers and clog engine intake systems. Divers are, likewise, susceptible to entanglement. Furthermore, solid waste that washes up on shore is unattractive and may be costly to remove.

In addition to solid waste, marina operators must be concerned about the proper collection and disposal of liquid wastes and of corrosive, reactive, toxic, and/or ignitable materials, *i.e.*, hazardous wastes.

Legal Setting

Marine Plastic Pollution Research and Control Act

The Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA), Title II of Public Law 100-220, restricts the overboard discharge of garbage. Its primary emphasis is on plastics; it is illegal to discharge plastic materials into any waterbody. The disposal of other types of garbage is restricted according to how far a vessel is out to sea. The important thing to remember is that within the bays, along rivers, and on inland lakes, the discharge of any garbage into the water is illegal. Fish guts are sometimes an exception. The discharge of fish waste into New Jersey waters is not desirable, and in some cases illegal, such as in the Manasquan River.

The law also requires that marinas be able to accept garbage from vessels that normally do business with them.

Resource Conservation and Recovery Act and State Hazardous Waste Laws

The Federal Resource Conservation and Recovery Act (RCRA) of 1976 was established to improve the collection, transportation, separation, recovery, and disposal of solid and hazardous waste. RCRA and the State's Solid Waste regulations (NJAC 7:26-1 et seq.), Hazardous Waste regulations (NJAC 7:26g et seq.), and Recycling regulations (7:26a et seq.) govern the management of hazardous waste in the State of New Jersey.

Hazardous wastes are ignitable, corrosive, reactive, and/or toxic. A list of controlled hazardous wastes can be found at http://www.epa.gov/earth1r6/6en/h/haztraks/hazwaste.htm. New Jersey has adopted EPA's list of hazardous wastes and referenced it in the State's hazardous waste law. It may be helpful to visit the NJDEP website at www.state.nj.us/dep/dshw and view the waste classification form to determine if waste is considered hazardous. The waste classification form will include a list of many of the contaminants of concern. Facilities and transporters that handle hazardous wastes are available on the NJDEP website. Hazardous waste "generators" are those individuals or companies that produce greater than 100 kilograms (about 220 pounds or 30 gallons) of hazardous waste during one calendar month or who store more than 100 kg at any one time. The following requirements apply to all hazardous waste generators.

- All generators and transporters of hazardous waste must apply to the New Jersey Department of the Environmental Protection (NJDEP) for an Environmental Protection Agency (EPA) identification number, Use EPA Form 8700-12 (available from NJDEP).
- Store hazardous waste in UL listed or Factory Mutual approved containers that are labeled and marked according to Department of Transportation regulations. Refer to 49 CFR 178. Mark the date accumulation begins on each container. Store containers on pallets to prevent corrosion and in an area able to contain any leaks. Keep containers closed unless waste is being added or removed. Inspect containers weekly.
- Store quantities of waste greater than 100 kg (220 lbs) but less than 500 kg (1,100 lbs) for a maximum of 180 days. Any quantity of waste greater than 500 kg can be stored for a maximum of 90 days.
- Prepare a written emergency contingency plan if you produce or accumulate more than 100 kg (220 lbs) of hazardous waste. Copies must be given to NJDEP and local agencies.
- Document all hazardous waste training in each employee's personnel file. All personnel who handle hazardous waste must receive training to ensure compliance with the State regulations. Transporters have to be registered and are listed on the DEP web page.
- Anybody who sends hazardous waste offsite for treatment, storage, or disposal must prepare a manifest. Ensure that all of the information on the manifest is correct. The hazardous waste manifest must accompany all hazardous wastes "from cradle to grave." It is your responsibility to insure that the driver and the vehicle are certified to handle hazardous waste. Each transporter of the hazardous waste must receive and sign the manifest as should the owner or operator of the treatment, storage, or disposal facility. A final copy must be returned to the generator once the waste has been properly treated, stored, or disposed of.

Carefully store hazardous materials. Place in UL listed or Factory Mutual approved containers and inspect storage containers weekly. Store containers on pallets to prevent corrosion.

- Submit a biannual report to NJDEP that summarizes hazardous waste activities during odd numbered years. It is recommended, but not mandatory, to report figures for even numbered years too.
- Retain all records, including manifests and waste analysis and annual reports, for at least three years. The files must be available for inspection by NJDEP.

Facilities that generate less than 100 kg of hazardous waste per month and which do not accumulate more than 100 kg of waste at any one time are considered "small quantity generators." Small quantity generators are not required to register with the EPA. Hazardous waste from small quantity generators should be sent to a disposal facility that is permitted, licensed, or registered by the State to manage municipal or industrial solid waste.

Best Management Practices to Properly Contain and Dispose of Waste

Reduce Waste. In addition to the suggestions offered in the balance of this Guidebook, consider the following recommendations to further reduce waste. Keep in mind that less waste means lower disposal costs.

- 👍 Avoid having leftover materials by sizing up a job, evaluating what your actual needs are, and buying just enough product for the job. Encourage boaters to do the same.
- 👍 Minimize office waste: make double-sided copies, use scrap paper for notes and messages, purchase recycled office paper, and reuse polystyrene peanuts or give them to companies that will reuse them, *e.g.*, small scale packing and shipping companies.
- 👍 Request alternative packing material from vendors, *e.g.*, paper, potato starch peanuts, popcorn, etc.
- 👍 Discourage the use of plastic and styrofoam cups, food containers, utensils, and other non-biodegradable products.
- ✓ Encourage boaters to exchange excess paints, thinners, varnishes, etc. To facilitate this type of activity, provide a bulletin board where boaters can post notices that they are seeking particular materials or have an excess of a substance.
- ✓ Post the names of local schools or theater groups that are willing to accept excess, non-toxic paints.

Control the Disposal of Fish Waste. When large amounts of fish guts are deposited in an enclosed area, the resultant, unsightly mess can produce foul odors and a decrease in levels of dissolved oxygen.

- 👍 Establish fish cleaning areas. Adopt one of the following methods to dispose of the waste.
  - Provide a stainless steel sink equipped with a garbage disposal that is connected to a sanitary sewer.

- Compost fish waste. Proper composting will control the odor and, over time, will produce an excellent soil conditioner that can be used for your landscaping needs. Contact Minnesota Sea Grant for a copy of *Composting Fish Waste* by Thomas Halbach and Dale Baker. This booklet provides instructions for composting 25 five-gallon buckets of fish waste per week using sphagnum peat moss and wood chips.
- Instruct boaters to place fish scraps in plastic bags and dispose in dumpster or at home.
- Instruct boaters to dispose fish scraps off shore over deep water.

👍 Prohibit fish cleaning outside of designated areas.

👍 Post signs directing people to clean their fish at a fish cleaning station or at home.

Manage Trash.

👍 Develop your waste management strategy based on the number of patrons, the types of waste generated, the layout of your marina, and the amount of staff time you can devote. Ask boaters specifically what their needs are.

👍 Promote your image as a responsible business by providing adequate and reasonably attractive trash receptacles, *e.g.*, cans, bins, dumpsters. Locate trash receptacles in convenient locations. Select high traffic areas such as at the landside foot of the dock, near bathrooms and showers, alongside vending machines, adjacent to the marina office, or on the path to the parking lot.

👍 Do not place trash containers on docks as waste may inadvertently be tossed or blown into the water.

👍 Select containers that are large enough to hold the expected volume of trash. On average, 4 to 6 gallons of reception capacity is needed per person per vessel per day. A cubic yard of dumpster space holds 216 gallons of trash.

👍 Provide lids or some other means to trap the waste inside and to prevent animals and rainwater from getting in.

👍 Post signs indicating what may not be placed in the dumpster: engine oil, antifreeze, paints, solvents, varnishes, pesticides, lead batteries, transmission fluid, distress flares, and polystyrene peanuts (loose peanuts tend to blow away).

👍 Require all employees to be involved in policing the facility for trash and vessel maintenance wastes. Do not allow litter to mar your grounds or near-shore areas.

👍 Use a pool skimmer or crab net to collect floating debris that collects along bulkheads or elsewhere within your marina.

✓ Post signs directing people to trash receptacles if they are not in plain view.

✓ Provide lights around trash receptacles so that they are easy to find and safe.

✓ Plant or construct a windscreen around the dumpster to make the area more attractive and to prevent trash from blowing away. Use native shrubs such as red chokeberry (*Aronia arbutifolia*), spicebush (*Lindera benzoin*) or mountain laurel (*Kalmia latifolia*).

Require all employees to police the facility for trash and vessel maintenance waste. Use a pool skimmer or crab net to collect floating debris along bulkheads.

Recycle Whenever Possible. Divert reusable materials out of the waste stream. A recycling program is an easy, highly visible means to demonstrate environmental stewardship. Recycling programs are also a good way to introduce patrons to pollution prevention practices. In fact, many are likely to already be in the habit of recycling at home and may expect to see recycling bins. The added cost of providing recycling facilities may be offset by income derived from the sale of some high quality recyclable items such as lead batteries, office paper, aluminum, and cardboard. Also, you may realize cost savings due to less frequent tipping of your dumpster(s) because of the reduced volume of trash.

- 👍 Contact a waste hauler or your local solid waste recycling coordinator (refer to *Appendix III*) to learn what materials are collected in your area. The following materials may be recycled: antifreeze, oil, metal fuel filter canisters, solvents, glass, shrink wrap, type 1 and 2 plastics, aluminum, steel, tin, lead batteries, newspaper, corrugated cardboard, mixed paper, scrap metal, tires, and white goods (appliances).
- ✓ Post information about local recycling services if you are not able to provide all of the desired services at your facility. Refer to *Appendix III* for county and State recycling contacts. Or, call NJDEP's Recycling Hotline at 609-984-3438 for the nearest used oil and antifreeze recycling center.

Recycle Solid Waste.

- 👍 Provide containers to collect, at a minimum, plastic, glass, aluminum, and newspaper.
- 👍 Clearly mark each container so people know what may and may not be put in it.
- 👍 Provide lids or some type of restricted opening to prevent the collected material from being lifted out by the wind and to prevent rainwater from collecting inside.
- 👍 Place the collection bins for solid recyclables in convenient locations. High traffic areas near trash receptacles are best.
- ✓ Make the recycling bins look different from the standard trash cans, *e.g.*, use a different color or material.

Recycle Liquid Waste.

- 👍 Provide containers to collect oil and antifreeze. Also, collect solvents from your boatyard according to hazardous waste regulations.
- 👍 Provide separate containers for oil, antifreeze, and solvents.
- 👍 Surround tanks with impervious, secondary containment that is capable of holding 110 percent of the volume of each tank.
- ✓ Try to shelter tanks from the elements.
- 👍 Attach funnels to tanks to reduce chances of spills. Funnels should be large enough to drain portable containers and oil filters.
- 👍 Check with your recycler to learn what materials may be mixed. Generally speaking, engine oil, transmission fluid, hydraulic fluid, and gear oil may all be placed in a waste oil container. Some haulers will also take diesel and kerosene. Ethylene glycol and propylene glycol antifreeze are often collected in the same used antifreeze tank. As a precaution though, CHECK WITH YOUR RECYCLER BEFORE MIXING ANY MATERIALS.
- 👍 Post signs indicating what may and may not be placed in each tank.

- Do not allow patrons to pour gasoline, solvents, paint, varnishes, or pesticides into the oil or antifreeze recycling containers. The introduction of these materials creates a "hazardous waste." The whole tank must be disposed of as hazardous waste: a very expensive undertaking.
- ✓ Consider locking the intake to oil and antifreeze recycling containers to prevent contamination. If you do lock the tanks, instruct your patrons to get the key from the appropriate staff person or to leave their oil or antifreeze next to the collection tank. If you select the second option, assign a member of your staff to inspect the collection site daily for any material that may have been dropped off.
- Be aware that recycling liquid materials is a long-term obligation. Investigate waste haulers to insure that they do actually recycle the collected material. Maintain shipping manifests for solvents and other hazardous wastes for a minimum of 3 years (manifests are not required for used oil and antifreeze that is being recycled).

Minimize Your Use of Hazardous Products. By minimizing your use of hazardous products, you can reduce health and safety risks to your staff, tenants, and contractors; lower disposal costs; decrease liability; and limit chances that you will be responsible for a costly clean-up of inappropriately disposed material.

- Avoid using products that are corrosive, reactive, toxic, or ignitable, to the greatest extent possible. The use of these materials is likely to generate hazardous waste.
- Adopt an inventory control plan to minimize the amount of hazardous material you purchase, store, and dispose of.
- Do not store large amounts of hazardous materials. Purchase hazardous materials in quantities that you will use up quickly.
- Establish a "first-in first-out" policy to reduce storage time. Dispose of excess material every 6 months.

Decrease liability – minimize the use of hazardous products. Do not store large amounts of hazardous materials. Purchase in quantities you will use up quickly.

Box 4. How Do You Know if a Substance is Hazardous?

All waste generators must determine whether or not their refuse is hazardous. Use the following steps to determine if you have hazardous waste.

1. It is listed as a hazardous waste as defined in N.J.A.C. 7:26g
2. The waste exhibits one or more of the characteristics of hazardous materials: ignitability, corrosivity, reactivity, or toxicity. A generator may either test the waste to determine if it exhibits a hazardous characteristic or use knowledge of the waste, *e.g.*, first hand experience or information gathered from a Material Safety Data Sheet. The test for toxicity is called the Toxicity Characteristic Leaching Procedure (TCLP) and is performed by industrial laboratories.

Store Solvents and Hazardous Materials with Care.

- γ Store solvents and other hazardous materials in fire-safe containers that are UL listed or Factory Mutual approved. Containers must meet U.S. Department of Transportation standards for protecting against the risks to life and property inherent in the transportation of hazardous materials. Approved containers will carry specification markings (*e.g.*, DOT 4B240ET) in an unobstructed area. Refer to 49 CFR 178 for additional packaging specifications.
- γ Plainly label all stored and containerized material. For hazardous waste, mark the date accumulation begins and ends on each container.
- γ Store containers on pallets in a protected, secure location away from drains and sources of ignition. Routinely inspect the storage area for leaks.
- γ To minimize air pollution, cap solvents and paint thinners whenever not in use. Store rags or paper saturated with solvents in tightly closed, clearly labeled containers.
- γ Separate hazardous chemicals by hazardous class. Call NJDEP at (609) 984-3219 for the Bureau of Chemical Release Information and Prevention to determine which classes the chemicals you have fall into.
- 👍 Assign control over hazardous supplies to a limited number of people who have been trained to handle hazardous materials and understand the first-in first-out policy.
- 👍 Routinely check the date of materials to prevent them from outlasting their shelf life.

Follow Recommended Disposal Methods. The following table contains information about recommendations for the proper disposal of wastes typically found at marinas. Refer to *Appendix III & IV* for lists of recyclers and hazardous waste haulers.

Table 2. Recommended Disposal Methods

Waste	**Disposal Options** **If multiple options are listed, the first option (✓) is the preferred method**
Antifreeze • Propylene glycol • Ethylene glycol *Contact your waste hauler to confirm that they will accept mixed antifreeze.*	✔Recycle • Hire a waste hauler to collect and dispose. • Purchase an on-site recovery unit. Distillation systems are more expensive than filtration systems but are more efficient at renewing used antifreeze.
Waste Oil • Engine oil • Transmission fluid • Hydraulic oil • Gear oil • #2 Diesel • Kerosene *Contact your waste hauler to confirm that they will accept mixed oil.*	✓ Recycle • Use waste oil for space heating (subject to regulations under N.J.A.C. 7:26A. Call 609-984-6985 for assistance.) • Take small quantities to a household hazardous waste collection day.
Quart Oil Cans	✓ Drain completely and dispose in regular trash. They cannot be recycled.
Non-terneplated Fuel Filters	✓ Puncture and completely hot drain for at least 12 hours. Recycle the oil and the metal canister. • If you do not recycle the canister, double-bag it in plastic and place it in your regular trash.
Terneplated Fuel Filter (used in heavy equipment and heavy-duty trucks)	✓ Dispose of as hazardous waste (contains lead).
Stale Gasoline	✓ Add stabilizer in the winter to prevent it from becoming stale or an octane booster in the spring to rejuvenate it. Use the fuel. • Mix with fresh fuel and use. • Hire a hazardous waste hauler to collect and dispose of. A hazardous waste manifest is required. • Take small quantities to a household hazardous waste collection day.

Table 2. Recommended Disposal Methods, page 2 of 4

Waste	**Disposal Options** **If multiple options are listed, the first option (✓) is the prefered method**
Kerosene	✓ Filter and reuse for as long as possible then recycle.
Mineral Spirits	✓ Filter and reuse.
Solvents • Paint and engine cleaners such as acetone and methylene chloride	✓ Reuse as long as possible and then recycle. • Dispose of as hazardous waste.
Sludge Recovered from a Solvent Listed as a Hazardous Waste Under NJAC 7:26g	✓ Dispose of as hazardous waste.
Sludge Recovered from a Solvent Not Listed as a Hazardous Waste Under NJAC 7:26g and Which Does Not Exhibit Hazardous Characteristics	✓ Let sludge dry in a well-ventilated area, wrap in newspaper, and dispose in garbage.
Paints and Varnishes: • Latex • Water-based • Oil-based	✓ Allow to dry completely. Dispose in regular trash. • Use leftover material for other projects, *i.e.*, as an undercoat for the next boat. • Encourage tenants to swap unused material.
Paint Brushes	✓ Allow to dry completely. Discard in regular trash.
Paint Filters	✓ Allow to dry completely prior to disposal. Treat as hazardous waste if paint contains heavy metals above regulatory levels.
Rags Soaked with Hazardous Substances	✓ Keep in covered container until ready to dispose. Dispose of the solvent that collects in the bottom of the container as hazardous waste. ✓ Wring rags out over a collection receptacle and have laundered by an industrial laundry. • If rags fail TCLP test, dispose of as hazardous waste.
Used Oil Absorbent Material	✓ If it is saturated with oil or diesel, double bag it in plastic and discard in trash (as long as no petroleum is leaking). ✓ If it is saturated with gasoline, allow it to air dry and reuse.
Used Bioremediating Bilge Booms	✓ Dispose in regular trash as long as no liquid is dripping. Because the microbes need oxygen to function, do not seal in plastic.
Epoxy and polyester resins	✓ Catalyze and dispose of as solid waste.

Table 2. Recommended Disposal Methods, page 3 of 4

Waste	Disposal Options **If multiple options are listed, the first option (✓) is the preferred method**
Glue and Liquid Adhesives	✓ Catalyze and dispose of as solid waste.
Containers • Paint cans • Buckets • Spent caulking tubes • Aerosol cans	✓ May be put in trash can as long as: • All material that can be removed has been. Be sure no more than 1'' of residue is on the bottom or inner liner. • Containers that held compressed gas are at atmospheric pressure. • Containers that held acute hazardous waste have been triple rinsed with solvent. Properly dispose of the solvent.
Residue from Sanding, Scraping, and Blasting	✓ Dispose of as solid waste.
Residue from Pressure Washing	✓ Dispose of as solid waste.
Lead Batteries	✓ Recycle or sell to scrap dealers. Store on an impervious surface, under cover. Protect from freezing. Check frequently for leakage. • Inform boaters that if they bring their old battery to a dealer, they will receive a $5 refund on a new battery.
Expired Distress Signal Flares	✓ Encourage boaters to keep onboard as extras. ✓ Store in well-marked, fire safe container. Use expired flares to demonstrate to boaters how they are used. Be sure to notify the fire department and Coast Guard ahead of time-especially if using aerial flares. Conduct the demonstration over water. • Encourage boaters to bring to local fire department or household hazardous waste collection day.
Scrap Metal	✓ Recycle.
Light Bulbs • Fluorescent bulbs • Mercury vapor lamps • High-pressure sodium vapor lights • Low-pressure sodium vapor lights • Metal halide lamps	✓ Recycle if you have more than 10 to dispose of. • If fewer than 10, treat as solid waste.
Refrigerants	✓ Recycle. If you deal with AC, you must be certified and use EPA approved CFC recovery and recycling equipment. • Use alternative refrigerants: HCFC-22 (for ACS and electric chillers), HCFC-123 (replaces CFC-11), HFH-134A (replaces CFC-12).

Table 2. Recommended Disposal Methods, page 4 of 4

Waste	Disposal Options If multiple options are listed, the first option (✓) is the preferred method
Monofilament Fishing Line	✓ Recycle through a manufacturer or tackle shop.
Scrap Tires	✓ Recycle. Register with NJDEP if you will be collecting more than 50 tires. Contact the Bureau of Recycling and Planning at 984-3438 for additional information Store according to National Fire Protection Association Standards.
Pesticides	✓ Dispose of as hazardous waste.
Plastic Shrink Wrap	✓ Recycle.
Fish Waste	✓ Prohibit disposal of fish waste into confined marina waters. Establish a fish cleaning station and adopt one of the following disposal methods: • Equip the cleaning station with a garbage disposal connected to municipal sewer. • Compost the scraps. • Instruct boaters to bag scraps in plastic and place in a dumpster or bring home. • Instruct boaters to dispose scraps off shore over deep water.

Track Pollution Incidents.

✓ Copy and use the *Pollution Report and Action Log* included at the end of this chapter to track pollution incidents and actions taken.

✓ Post the *Log* on a clipboard in the maintenance area or another easily accessible location.

✓ Consult the *Pollution Report and Action Log* daily.

Educate Boaters.

👍 Photocopy and distribute the following *Clean Boating Tip Sheet* to your tenants. There is room to add your marina's name and logo.

✓ Contact the Center for Marine Conservation (1-202-429-5609) for marine debris educational materials at minimal cost.

✓ Post information about county Household Hazardous Waste Collection events and recycling centers. See *Appendix III* for a list of local coordinators.

Pollution Report and Action Log

Report Date	Staff Reporting	Problem Description	Action Taken	Action Date	Staff Handling

Clean Boating Tip Sheet

Waste Contamination and Disposal

Trash is ugly and may be dangerous - dangerous to humans and to wildlife. For example, plastic may snare propellers and choke sea turtles. Congress passed a law in 1987 to protect our waterways from garbage. The Marine Plastic Pollution Research and Control Act (Title II of Public Law 100-220) regulates the disposal of garbage at sea according to how far a vessel is from shore:

- Within U.S. lakes, rivers, bays, sounds, and within 3 nautical miles from the ocean shore, it is illegal to dump anything other than fish guts.
- Between 3 and 12 nautical miles from shore, it is illegal to dump plastic and any other garbage that is greater than one inch in size.
- Between 12 and 25 nautical miles from shore, it is illegal to dump plastic and dunnage, *i.e.*, lining and packing material, nets, lines, etc.
- Beyond 25 nautical miles, it is illegal to dump plastic.

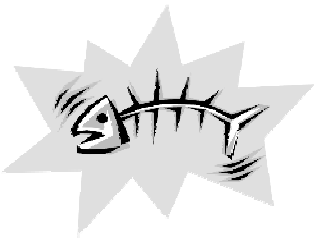
Meeting the law is easy. Just follow these tips!

Contain Trash

- Don't let trash get thrown or blown overboard.
- If trash blows overboard, retrieve it. Consider it "crew-overboard" practice.
- Pack food in reusable containers.
- Buy products without plastic or excessive packaging.
- Don't toss cigarette butts overboard. They are made of plastic (cellulose acetate).
- Purchase refreshments in recyclable containers and recycle them.
- Properly dispose of all trash on-shore, *e.g.*, bring home or leave in a dumpster at the marina.

Recycle

- Recycle cans, glass, newspaper, antifreeze, oil, oil filters, and lead batteries.
- Call 1-609-984-3438 for locations.
- Bring used monofilament fishing line to recycling bins at your tackle shop or marina.



Fish Scraps

For safety reasons, marinas are often located in sheltered areas-areas that will protect boats from wind and waves during a storm. The same features that protect boats during a storm, however, also limit the exchange of water. Poor exchange, or flushing, means that any waste that is discharged into the water may stay in the same general area for an extended length of time.

Fish cleaning may pose a problem if the guts are discarded into a poorly flushed marina basin. Fish waste is smelly and unsightly. Also, life-sustaining oxygen is removed from the water column as bacteria decompose the innards. Avoid problems by following these tips.

- Do not discard fish waste in poorly flushed areas.
- Find out what your marina's disposal policy is.
- Bag waste and dispose at home or in a dumpster.
- Dispose over deep water.

Maintenance Waste

Dispose of the following items according to the recommendations listed below. Call 609-9843438 for recycling center locations or visit www.state.nj.us/dep/dshw/recycle/recycoor.htm for the names and numbers of local recycling and hazardous waste coordinators.

Waste Product	Disposal Method
Oil	Recycle.
Oil Filters	Puncture and hot drain for 12 hours. Recycle oil and canister.
Antifreeze	Recycle.
Paint and Varnish	Allow to dry completely, *i.e.*, solidify. Dispose in regular trash.
Solvents, Gasoline, and Pesticides	Bring to a household hazardous waste collection day.
Expired Emergency Flares	Bring to local fire department or a household hazardous waste collection day.

For more information about the Clean Marina Initiative, contact the Manasquan Watershed Management Group at (732) 542-3630.

Manasquan
Watershed
Management
Group
(732) 542-3630

Marina Management

Staff Training

- Stormwater Pollution Prevention Plan
- Emergency Response Plans
- Be Watchful
- Approach Polluters
- Investigate Community College Offerings
- Maintain Training Records

Inform Patrons and Independent Contractors

- Incorporate Best Management Practices into Contracts
- Post Signs Detailing Best Management Practices
- Distribute Literature to Patrons
- Host a Workshop
- Make Use of Informal Communication Mechanisms
- Recognize Boaters

Public Relations

- Publicize Your Good Deeds
- Become a Clean Marina
- Business Practices
- Offer Environmental Audits for Boaters
- Avoid Environmental Surcharges
- Be Diligent

Marina Management

Once you have adopted some of the best management practices outlined in this Guidebook tell people about it! Train your staff so that they will routinely minimize pollution. Inform boaters how their actions can effect water quality. And let the public know that you are doing your part to protect the environment.

Staff Training

Stormwater Pollution Prevention Plan. The General Permit for discharges from marinas can be easily implemented if you teach your employees about the components and goals of the stormwater pollution prevention plan. Training should include the following topics as applicable.

- 👍 Used oil management
- 👍 Spent solvent management
- 👍 Proper disposal of spent abrasives
- 👍 Disposal of vessel wastewater
- 👍 Spill prevention and control
- 👍 Fueling procedures
- 👍 General good housekeeping
- 👍 Painting and blasting procedures
- 👍 Used battery management

Also, provide training on the proper use of equipment such as dustless sanders and high-volume low-pressure paint spray guns.

Emergency Response Plans. During a real emergency-when time is of the essence-you will want people to know what to do and how to do it.

- 👍 Review plans and response procedures with staff at the beginning of each boating season.
- 👍 Train employees in the use of containment measures.
- 👍 Run emergency response drills at least twice annually.
- ✓ Invite U.S. Coast Guard and local fire department to demonstrate emergency response procedures at your marina.

Be Watchful. Involve all employees in policing your marina for waste. Encourage your staff to look for and immediately halt the following activities.

- ✓ Colored plumes in the water where a hull is being cleaned.
- ✓ Bilge water discharge with a sheen.
- ✓ Uncontained sanding, painting, varnishing, or cleaning.
- ✓ Maintenance debris being washed into the water.
- ✓ Sewage discharges within the marina.
- ✓ The use of environmentally harmful cleaning products.

Approach Polluters.

- Determine who will address boaters and contractors who are polluting. Generally speaking, this is a job for the manager. Let your staff know whether they should handle polluters themselves or report pollution incidents to the manager.
- Politely inform boaters and contractors why what they are doing is harmful. Describe a more environmentally sensitive method and ask the boater or contractor to stop work until it can be done with less environmental impact. It will be easier to get cooperation if you require boaters and contractors to practice pollution prevention as a condition of their contracts.
- If the problem persists, take these additional steps
  - Talk to the boater or contractor again.
  - Mail a written notice asking that the harmful practice stop. Keep a record of the mailing.
  - Remove the problem from the dock. Charge the boater or contractor for the cost of removal and clean-up.
  - Ask the tenant or contractor to leave your marina.

Approach polluters and explain how their action is harmful. Describe a more environmentally sensitive method and ask that they follow more sensitive practices.

Investigate Community College Offerings.

- Look for college courses related to environmental protection at your local community college.

Maintain Training Records.

- Record training dates, topics, and names of employees and instructors.
- Keep copies of instructional material.

Inform Patrons and Independent Contractors

The General Permit for discharges from marinas requires that customers and contractors be informed about pollution control practices and be required to use them.

Incorporate Best Management Practices into Contracts. In addition to being a legal document, contracts are very effective educational tools. Use the contract to inform boaters and contractors how to minimize their environmental impacts.

- Include language requiring the use of best management practices in all of your contracts: slip holders, liveaboards, transients, charters, workers, contractors, and tenants.
- Include language specifying the consequences for not using best management practices, *e.g.*, failure to use best management practices will result in expulsion from the marina and forfeiture of rental fees.
- Include information about requirements for Marine Sanitation Devices.
- ✓ See *Appendix V* for sample contract language. To receive an electronic copy visit www.shore.co.monmouth.nj.us/area12/documents.htm.

Post Signs Detailing Best Management Practices.

- 👍 Post signs at fuel docks and pumpout stations, along piers, in vessel maintenance areas, and at dumpsters and recycling stations. See samples below.
- 👍 Be sure the signs are visible.
- 👍 Signs must be durable, eye catching, and appropriately sized.
- 👍 Post your facility's environmental policy in a conspicuous location.

Keep Fuel out of the Water
Do Not Top Off Tank
Listen and Anticipate When Tank is Full
Wipe-up Spills Immediately

OIL SPILL RESPONSE KIT

Include name and number of person to contact at the marina in case of a spill

Be sure that a copy of the Oil Spill Response Plan is clearly visible inside the Spill Response Kit

Vessel Maintenance Area

- All major repairs (*e.g.*, stripping, fiberglassing) must be performed in the Vessel Maintenance Area
- All blasting and spray painting must be performed within the enclosed booth or under tarps
- Use tarps or filter fabric to collect paint chips and other debris
- Use vacuum sander (*include rental information if appropriate*)
- Use high-volume low-pressure spray *paint* guns (*include rental information if appropriate*)
- Use drip pans with all liquids
- Reuse solvents
- Store waste solvents, rags, and paints in covered containers

Notice
The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface water. Violators are subject to a penalty of $5,000.

The use of soaps to disperse oil is illegal. Violators may be fined up to $25,000 per incident.

Report Oil Spills to
USCG at (800) 424-8802 and
NJDEP at 1-877 WARN DEP

Pumpout Station

- *Instructions for use*
- *Hours of operation*
- *Fee*
- *Name and number of person to call in case of malfunction*

Do not Discharge Sewage
Please use our clean, comfortable restrooms while you are in port

Nutrients and pathogens in sewage impair water quality

Think Before You Throw
The following items may not be placed in this dumpster

- Oil
- Antifreeze
- Paint or varnish
- Solvents
- Pesticides
- Lead batteries
- Transmission fluid
- Distress flares
- Loose polystyrene peanuts
- Hazardous waste

Recycle

Oil
Antifreeze
Lead batteries
Glass
Plastic
Aluminum
Corrugated cardboard
Metal fuel filter canisters
Mixed Paper
Newspaper
Solvents
Steel
Scrap metal
Tin
Tires

Indicate which items you recycle and where the collection sites are

Include information about local recycling services for materials that you do not collect

Recycle Oil
This container is for

- Transmission Fluid
- Hydraulic fluid
- Gear Oil
- #2 Diesel
- Kerosene

Tailor to fit your hauler's requirements

Gasoline is STRICTLY PROHIBITED

If container is locked, include information about where to find the key or leave the oil

Recycle Antifreeze
This container is for

- Ethylene glycol antifreeze
- Propylene glycol antifreeze

Tailor to fit your hauler's requirements

Gasoline, diesel, kerosene, and all other materials are STRICTLY PROHIBITED

If container is locked, include information about where to find the key or leave the antifreeze

No Fish Scraps
Please do not discard fish scraps within the marina basin

- Use our fish cleaning station
- Bag the scraps and dispose in dumpster or at home
- Save and dispose over deep water

Marine Sanctuary
This marina provides food and shelter for young fish

- Prevent oil spills!
- Keep bilge clean!
- Use oil absorption pads!

Help by recycling or properly disposing of used oil, antifreeze, solvents, cleaners, plastics, and other wastes.

Environmental Policy
It is the policy of this marina to protect the health of our patrons, staff, and the environment by minimizing the discharge of pollutants to the water and air.

Thank you for keeping our waters clean and safe!

Distribute Literature to Patrons.

- 👍 Copy and distribute the *Clean Boating Tip Sheets* included in this Guidebook or create your own. Boater tip sheets on Vessel Maintenance, Petroleum Control, Boat Sewage, and Waste Disposal can be found at the end of each associated chapter.
- 👍 Send the tip sheets with monthly mailings or place in dock boxes or on vessels. Be cautious that they do not end up in the water.
- 👍 Include articles about best management practices in your newsletter.
- 👍 Get free copies of clean boating materials from organizations such as the New Jersey Marine Sciences Consortium, New Jersey Sea Grant College Program, the Marine Trades Association, Clean Ocean Action, New Jersey Department of Environmental Protection, SeaLand Technology, the Center for Marine Conservation, Rutgers Cooperative Extension, the Marine Environmental Education Foundation, the American Boat and Yachting Council, and Boat/U.S. Clean Water Trust.
- 👍 Contact the United States Coast Guard for publications summarizing Federal boating requirements.

Host a Workshop.

- 👍 Include a walking tour of the facility to demonstrate best management practices.
- 👍 Try to schedule the workshop to coincide with an existing marina function that is traditionally well attended.
- ✓ Offer incentives to attendees: door prizes, discounts, product samples, food.

Make Use of Informal Communication Mechanisms.

- 👍 Pass along pollution prevention information in conversations with patrons and contractors.
- 👍 Post information about best management practices on the marina bulletin board.

Recognize Boaters.

- Publicly recognize boaters who are making an effort to control pollution.
- Include a feature in your newsletter, post a flyer with the boater's picture on a public bulletin board, give an award, etc.

Public Relations

Publicize Your Good Deeds.

- Seek free publicity with local press, magazines, television, and radio outlets.
- Prepare news releases to highlight your innovative practices, new equipment or services, available literature, or a workshop you are sponsoring.
- Plan news releases to coincide with seasonal activities, *e.g.*, helpful tips for winterization.
- Start news releases with a contact person's name and phone number, the date, and a headline. The first paragraph should contain vital information: who, what, when, and where. Fill in with secondary information and support data. Conclude with a "call to action" (*e.g.*, visit the marina for a demonstration of the new plastic media blasting system). Double-space the text, One page is best. It should be no longer than two pages. Refer to the *Associated Press Style Book* for additional formatting information.
- Learn media deadlines and send releases in time to meet them.
- When submitting a news release, be sure you have the name of the correct editor and that it is spelled accurately.
- ✓ Get press kits from manufacturers of environmentally-sensitive products. Use their photographs and product information.

Become a Clean Marina.

- Apply to the New Jersey Department of Environmental Protection for recognition as a Clean Marina. Once you have satisfied the selection criteria, you may use the Clean Marina logo in your advertising and correspondence, fly a Clean Marina burgee, and enjoy promotion by the Clean Marina Initiative in publications, on the World Wide Web, and at public events.
- Use your selection into the program as an opportunity to prepare a press release.

Business Practices

Offer Environmental Audits for Boaters.

- ✓ Expand your business by selling environmental audits.
- ✓ Inspect engines, bilges, fuel systems, and marine sanitation devices.
- ✓ Sell oil absorbent pads, air/fuel separators, etc.

Avoid Environmental Surcharges.

- 👍 Charge for tangible items such as tarps, vacuum sanders, and protective clothing rather than a flat "environmental surcharge."
- ✓ Consider donating a portion of rental fees (*e.g.*, for vacuum sanders) to an environmental organization. The boater can feel good about controlling pollution and about the fact that a portion of his or her money is going to help conserve nature.

Be Diligent.

- 👍 Be absolutely diligent in containing pollution; your own and that created by your staff. Boaters will notice and follow your example.

Laws and Regulations

Selected Federal Agencies: and Their Jurisdictions

- Environmental Protection Agency
- National Oceanographic and Atmospheric Administration
- United States Army Corps of Engineers
- United States Coast Guard

Selected State Agencies and Their Jurisdictions

- Coastal Area Facilities Review Act
- New Jersey Department of Environmental Protection
- New Jersey Office of State Planning

Selected Federal Laws that Impact Marinas

- Clean Air Act Amendments, 1990
- Clean Vessel Act
- Coastal Zone Act Reauthorization Amendments of 1990
- Federal Water Pollution Control Act
- Marine Plastic Pollution Research and Control Act
- Oil Pollution Act of 1990
- Organotin Antifoulant Paint Control Act of 1988
- Refuse Act of 1899
- Resource Conservation and Recovery Act

Selected State Laws that Impact Marinas

- Marine Sanitation Devices
- Pumpout Systems
- Pollutant Discharge Prohibited

Environmental Permit and Licenses

- General Permit for Discharges from Marinas
- Summary of Environmental Permits and Licenses

Laws and Regulations

This chapter of laws, regulations, and permit information is by no means comprehensive. It is meant to provide:

- an introduction to the responsibilities of certain Federal and State agencies,
- an overview of some relevant laws,
- a look at the General Permit for discharges from marinas, and
- a synopsis of information about other pertinent permits and licenses.

Selected Federal Agencies and Their Jurisdictions

The **Environmental Protection Agency (EPA)** is responsible for ensuring that environmental protections are considered in U.S. policies concerning economic growth, energy, transportation, agriculture, industry, international trade, and natural resources; ensuring national efforts to reduce environmental risk are based on the best available scientific information; and providing access to information on ways business, state and local governments, communities, and citizens can prevent pollution and protect human health and the environment. The Office of Water is responsible for implementing, among other laws, the Clean Water Act, portions of the Coastal Zone Act Reauthorization Amendments of 1990, the Resource Conservation and Recovery Act, and the Marine Plastics Pollution Research and Control Act. Activities are targeted to prevent pollution wherever possible and to reduce risk to people and ecosystems in the most cost effective manner.

The mission of the **National Oceanographic and Atmospheric Administration (NOAA)**, an agency within the U.S. Department of Commerce, is to describe and predict changes in the earth's environment and to conserve and wisely manage the nation's coastal and marine resources to ensure sustainable economic opportunities. NOAA provides a wide range of observational, assessment, research, and predictive services for estuarine and coastal ocean regions. NOAA has developed an array of programs to address national-scale estuarine issues and specific problems affecting individual estuarine and coastal ocean systems. In partnership with EPA, NOAA implements the Coastal Zone Act Reauthorization Amendments of 1990.

The **United States Army Corps of Engineers (COE)** is responsible for ensuring adequate flood control, hydropower production, navigation, water supply storage, recreation, and fish and wildlife habitat. The Corps contracts and regulates coastal engineering projects, particularly harbor dredging and beach renourishment projects. They also review and permit coastal development and artificial reef projects. A joint permit from the New Jersey Department of Environmental Protection and the Army Corps of Engineers is required for all dredging projects.

The **United States Coast Guard**, an arm of the U.S. Department of Transportation, protects the public, the environment, and U.S. economic interests. They promote maritime safety and marine environmental protection, enforce maritime law, tend all

Federal navigation aids, and regulate and monitor recreational and commercial vessels and waterfront facilities.

Selected State Agencies and Their Jurisdictions

The mission of the **New Jersey Department of the Environment (NJDEP)** is to assist the residents of New Jersey in preserving, restoring, sustaining, protecting and enhancing the environment to ensure the integration of high environmental quality, public health and economic vitality. NJDEP coordinates all natural resources activities within the State affecting the State's bays, rivers, tributaries, fisheries, forests, parks, wildlife, and geology. They are responsible for providing the State with clean air, clean and plentiful water, safe and healthy communities, healthy ecosystems, abundant open space, and an open and effective government. NJDEP is the lead organization for the sewage pumpout program and issues general permits for marina activities.

The **New Jersey Office of State Planning**, through the State Development and Redevelopment Plan, works to improve the efficiency and reduce the costs of land development and infrastructure in New Jersey by expanding areas of coordination and cooperation among State and local agencies. The State Plan reflects a consensus about how New Jerseyans can best manage new development to preserve our natural resources and protect our economic vitality. It is, in effect, an investment prospectus for State agencies that can be used to support local planning goals and regulatory processes throughout government. The greatest benefit of using the State Plan is as a vehicle for coordinating the plans and programs of each level of government, and for providing a measure of predictability to local governments and private development interests. By striving to achieve its goals, we can enhance the quality and character of where we live, work, and play. The State Development and Redevelopment Plan is a tool to invigorate local control over the ways in which development, redevelopment, conservation and other land uses are decided. The plan can support localities as they seek to influence the way discretionary dollars made available by State agencies are allocated.

Selected Federal Laws that Impact Marinas

Clean Air Act Amendments, 1990

As a result of the 1990 Clean Air Act Amendments, the "gasoline marine final rule" establishes emission standards for new spark-ignition gasoline marine engines. Outboard engines and gasoline marine engines used in personal watercraft and jet boats are covered by the rule. Because sterndrive and inboard engines offer cleaner technologies, emission standards were not set for these types of engines.

Boat engines currently in use are not affected by this regulation. Boat owners are in no way responsible for making modifications to their current engines to meet the

standards. Likewise, boat dealers are not responsible for compliance with this regulation. The regulation does require that manufacturers of outboard and personal watercraft marine engines achieve yearly emission, reductions by meeting a corporate average emission standard which allows them to build some engines to emission levels lower than the emission standard and some engines to emission levels higher than the standard, provided the manufacturer's overall corporate average is at or below the standard.

Clean Vessel Act (CVA)

The Clean Vessel Act (CVA) provides funds to states to construct, renovate, and operate pumpout stations and to conduct boater environmental education. Contact the New Jersey Department of Environmental Protection for information about receiving up to $12,500 in grant funding to install a pumpout system.

Coastal Zone Act Reauthorization Amendment of 1990 (CZARA)

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA) provided the impetus for the Clean Marina initiative. Section 6217 of the Amendments require that nonpoint source pollution from marinas be contained. Through the Clean Marina Initiative, New Jersey is promoting voluntary adoption of best management practices to minimize the impact of marinas on surrounding land and water.

Federal Water Pollution Control Act

The Federal Water Pollution Control Act, commonly known as the Clean Water Act, addresses many facets of water quality protection. It provides the authority for the National Pollutant Discharge Elimination System (NPDES) permit program for point sources of pollution. The Act prohibits the discharge of oil or hazardous substances into U.S. navigable waters. It also prohibits the use of chemical agents like soaps, detergents, surfactants, or emulsifying agents to disperse fuel, oil, or other chemicals without the permission of the U.S. Coast Guard.

All vessels 26 feet in length and over are required to display a placard that is at least 5 by 8 inches, made of durable material, and fixed in a conspicuous place in the machinery spaces or at the bilge pump control station. The placard must read:

Discharge of Oil Prohibited

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000.

The Clean Water Act requires that the U.S. Coast Guard be notified anytime a spill produces a sheen on the water. Failure to report a spill may result in civil penalties.

The Act further requires that all recreational boats with installed toilets have an operable marine sanitation device on board (see "State Laws" below).

Marine Plastic Pollution Research and Control Act (MPPRCA)

The Marine Plastic Pollution Research and Control Act (MPPRCA) is the U.S. law that implements an international pollution prevention treaty known as MARPOL. The MPPRCA of 1987 (Title II of Public Law 100-220) restricts the overboard discharge of garbage. Its primary emphasis is on plastics; it is illegal to dispose of plastic materials into the water anywhere. The disposal of other garbage is restricted according to a vessel's distance from shore.

- Within U.S. lakes, rivers, bays, sounds, and within 3 nautical miles from shore, it is illegal to dump plastic, paper, rags, glass, metal, crockery, dunnage (lining and packing material, nets, lines, etc.), and food.
- Between 3 and 12 nautical miles from shore, it is illegal to dump plastic and any other garbage that is greater than one inch in size.
- Between 12 and 25 nautical miles from shore, it is illegal to dump plastic and dunnage.
- Beyond 25 nautical miles, it is illegal to dump plastic.

The dumping restrictions apply to *all* vessels operating in *all* navigable waters of the United States and the 200 mile Exclusive Economic Zone. All vessels greater than 26 feet must display a MARPOL placard outlining the garbage dumping restrictions. All vessels over 40 feet must also have a written waste management plan on board.

Under the national law, ports and terminals, including recreational marinas, must have adequate and convenient "reception facilities" for their regular customers. That is, marinas must be capable of receiving garbage from vessels that normally do business with them (including transients).

Oil Pollution Act of 1990 (OPA)

The Oil Pollution Act of 1990 (OPA) was written in direct response to the *Exxon Valdez* oil spill. The law primarily addresses commercial oil shipping (*e.g.*, tankers must be double-hulled, captains may lose their licenses for operating a vessel under the influence of drugs or alcohol). Some of the requirements are applicable to recreational boating, however. Most notably, the responsible party for any vessel or facility that discharges oil is liable for the removal costs of the oil and any damages to natural resources; real or personal property; subsistence uses; revenues, profits, and earning capacity; and public services like the cost of providing increased or additional public services. The financial liability for all non-tank vessels is $600 per gross ton, or $500,000, whichever is greater. Also, substantial civil penalties

may be imposed for failing to report a spill, for discharging oil, for failure to remove oil, failure to comply with regulations, and gross negligence.

Organotin Antifoulant Paint Control Act (OAPC) of 1988

The Organotin Antifoulant Paint Control Act restricts the use of organotin antifouling paints, including tributyl tin-based paints. Tributyl tin (TBT) paints may be used only on aluminum-hulled vessels, on boats larger than 82 feet (25 meters), and on outboard motors and lower drive units. Under the provision of the State antifoulant paint law, marina operators must obtain a license from the New Jersey Department of Environmental Protection to purchase and apply organotin antifouling paints, and hire a certified pesticide applicator. It is illegal for anybody without a license to distribute, sell, use, or possess antifoulants containing tributyl tin. The only exception is for spray cans that are 16 ounces or less and which do not exceed the release rate of less than or equal to 5.0 micrograms per square centimeter per day. For additional information contact NJDEP's Bureau of Pesticide Compliance at 609-984-6568.

Refuse Act of 1899

Hazardous Waste is considered to be ignitable, corrosive, reactive, or toxic.

The Refuse Act of 1899 prohibits throwing, discharging, or depositing any refuse matter of any kind (including trash, garbage, oil, and other liquid pollutants) into waters of the United States.

Resource Conservation and Recovery Act (RCRA)

The Federal Resource Conservation and Recovery Act (RCRA) provides the legal authority to establish standards for handling, transporting, and disposing of hazardous wastes. The New Jersey hazardous waste regulations (NJAC 7:26g et seq.) are based on RCRA.

Hazardous wastes are ignitable, corrosive, reactive, and/or toxic. Hazardous waste "generators" are those individuals or companies that produce greater than 100 kilograms (about 220 pounds or 30 gallons) of hazardous waste during one calendar month or who store more than 100 kg at any one time. The following requirements apply to all hazardous waste generators.

- γ All generators and transporters of hazardous waste must apply to the New Jersey Department of the Environmental Protection (NJDEP) for an Environmental Protection Agency (EPA) identification number. Use EPA Form 8700-12 (available from NJDEP).
- γ Store hazardous waste in UL listed or Factory Mutual approved containers that are labeled and marked according to Department of Transportation regulations (refer to 49 CFR 178). Mark the date accumulation begins on each container. Store containers on pallets to prevent corrosion in an area able to contain any leaks. Keep containers closed unless waste is being added or removed. Inspect containers weekly.
- γ Store quantities of waste greater than 100 kg (220 lbs) but less than 500 kg (1,100 lbs) for a maximum of 180 days. Any quantity of waste greater than 500 kg can be stored for a maximum of 90 days.

- Prepare a written emergency contingency plan if you produce or accumulate more than 100 kg (220 lbs) of hazardous waste. Copies must be given to NJDEP and local agencies.
- Document all hazardous waste training in each employee's personnel file. All personnel who handle hazardous waste must receive training to ensure compliance with the State regulations.
- Anybody who sends hazardous waste offsite for treatment, storage or disposal must prepare a manifest. Ensure that all of the information on the manifest is correct. The hazardous waste manifest must accompany all hazardous wastes "from cradle to grave." It is *your* responsibility to insure that the driver and the vehicle are certified to handle hazardous waste. Each transporter of the hazardous waste must receive and sign the manifest as should the owner or operator of the treatment, storage, or disposal facility. A final copy must be returned to the generator once the waste has been properly treated, stored, or disposed.
- Submit a bi-annual report to NJDEP that summarizes hazardous waste activities during odd numbered years. It is recommended, but not mandatory, to report figures for even numbered years too.
- Retain all records, including manifests and waste analysis and annual reports, for at least three years. The files must be available for inspection by NJDEP.

Facilities that generate less than 100 kg of hazardous waste per month and which do not accumulate more than 100 kg of waste at any one time are considered "small quantity generators." Small quantity generators are not required to register with the EPA. Hazardous waste from small quantity generators should be sent to a disposal facility that is permitted, licensed, or registered by the State to manage municipal or industrial solid waste.

Selected State Laws that Impact Marinas

Marine Sanitation Devices

The Federal Clean Water Act and New Jersey's Marine Sewage Treatment Act (P.L. 1988, Chapter 117) require that any vessel with an installed toilet be equipped with a certified Type I, Type II, or Type III marine sanitation device (MSD):

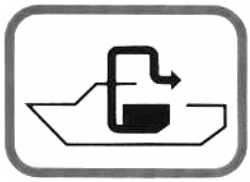
- *Type I* systems mechanically cut solids, disinfect the waste with a chemical additive or with chlorine disassociated from salt water with an electronic jolt, and discharge the treated sewage overboard. The fecal coliform bacteria count of the effluent may be no greater than 1,000 per 100 milliliters and may not contain any floating solids.

- *Type II* systems are similar to Type I systems except that the Type IIs treat the sewage to a higher standard: effluent fecal coliform bacteria levels may not exceed 200 per 100 milliliters, and total suspended solids may not be greater than 150 milligrams per liter. Type IIs also require more space and have greater operating energy requirements.

- *Type III* systems do not allow sewage to be discharged. The most common form of a Type III system is a holding tank. Other forms include recirculating and incinerating systems.

Vessels 65 feet and under may have any of the three types of MSDs. Vessels over 65 feet must have a Type II or III system. Additionally, Type I and Type II systems must display a certification label affixed by the manufacturer. A certification label is not required on Type III systems.

The State law allows a vessel with an installed toilet to have a "Y" valve or other means to by-pass the sanitation system. Within State waters all pathways for overboard discharge of raw sewage must be secured. The "Y" valve may be secured with a padlock or a non-reusable nylon tie known as a wire tie. Alternatively, the valve handle can be moved to the closed position and removed.



Finally, any vessel with an installed toilet that is offered as a non-captained charter must be equipped with an operational MSD. The lease agreement signed by the leasing party must include a paragraph outlining the operator's responsibility.

Pumpout Systems

The State's Marine Sewage Treatment Act of 1988 requires:

γ All publicly owned or operated marinas, which accommodate vessels equipped with marine sanitation devices, to provide sewage pumpout facilities and portable toilet emptying receptacles.

γ Installation of a pumpout system is required as a condition of receiving a waterfront development permit from the New Jersey Department of Environmental Protection. NJDEP has been requiring MSD pumpout facilities as a condition of approval for new or expanded marinas of 10 or more slips since February 6, 1986.

Pollutant Discharge Prohibited

The New Jersey Water Pollution Control Act (N.J.S.A. 58:10A-6) prohibits the discharge of any pollutant into State waters without a discharge permit.

The Coastal Area Facility Review Act (N.J.S.A. 13:19)

The Coastal Area Facility Review Act (CAFRA) applies to projects near coastal waters in the southern part of the State. The CAFRA area begins where the Cheesequake Creek enters Raritan Bay in Old Bridge, Middlesex County. It extends south along the coast around Cape May, and then north along the Delaware Bay ending at the Kilcohook National Wildlife Refuge in Salem County. The inland limit

of the CAFRA area follows an irregular line drawn along public roads, railroad tracks, and other features. The CAFRA area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline. The law divides the CAFRA area into pieces or zones, and regulates different types of development in each zone.

The CAFRA law regulates almost all development activities involved in residential, commercial, or industrial development, including construction, relocation, and enlargement of buildings or structures; and all related work, such as excavation, grading, shore protection structures, and site preparation. CAFRA requires specific project designs for new marinas that promote water quality and protect public health.

CAFRA contains exemptions for certain minor activities such as maintenance, plantings, decks or similar structures at a residence, rebuilding a damaged structure on the same building footprint (if it was damaged after 7/19/94), and enlarging a dwelling without increasing its footprint or number of units. Contact NJDEP at 609-292-1932 for a complete list of available exemptions.

The Waterfront Development Law

The Waterfront Development Law (N.J.S.A. 12:5-3) is a very old law, passed in 1914, that seeks to limit problems that new development could cause for existing navigation channels, marinas, moorings, other existing uses, and the environment.

Any development in a tidally flowed waterway anywhere in New Jersey requires a Waterfront Development Permit. Examples of projects that need a Waterfront Development Permit include docks, piers, pilings, bulkheads, marinas, bridges, pipelines, cables, and dredging.

For development outside of the CAFRA area, the Waterfront Development Law regulates not only activities in tidal waters, but also the area adjacent to the water, extending from the mean high water line to the first paved public road, railroad or surveyable property line. At a minimum, the zone extends at least 100 feet but no more than 500 feet inland from the tidal water body. Within this zone, NJDEP must review construction, reconstruction, alteration, expansion or enlargement of structures, excavation, and filling.

The Waterfront Development Program exempts the repair, replacement or reconstruction of some legally existing docks, piers, bulkheads and buildings, if the structure existed before 1978 and if other conditions are met. Also, there are exemptions for certain single family homes and for small (5,000 square feet) additions to certain existing structures, if the single family home or structure is located more than 100 feet inland from the mean high water line.

Wetlands Act of 1970

The land immediately adjacent to tidal waters often contains coastal wetlands. These wetland areas are a vital coastal resource serving as habitat for many creatures. The wetlands also serve as buffers that protect upland areas from the flooding and damage caused by storms.

The Wetlands Act of 1970 (N.J.S.A. 13:9A) requires NJDEP to regulate development in coastal wetlands. Any time land is located near tidal water there is a good possibility of coastal wetlands on the property. Some signs that may indicate the presence of wetlands are tall reeds and grasses, or ground that is often soggy. The regulated coastal wetlands are shown on maps prepared by the NJDEP. Unlike NJDEP's freshwater wetlands maps, the coastal wetlands maps are used to determine jurisdiction. You must have a coastal wetlands permit to excavate, dredge, fill or place a structure on any coastal wetland shown on the maps.

Tidelands Act

The Tidelands Act (N.J.S.A. 12:3) protects "riparian lands" that are currently or formerly flowed by the tide of a natural waterway. This includes lands that were previously flowed by the tide but have been filled and are no longer flowed by the tide. Tidelands are owned by the citizens of New Jersey. You must first get permission from the State and pay for the use of these lands, in the form of a tidelands license, lease or grant.

Environmental Permit and Licenses

General Permit for Discharges from Marinas (NJ0088315)

Who must obtain a permit?

In 1990, EPA implemented regulations requiring permits for stormwater discharges from certain activities. The stormwater permit program requires that certain marinas classified by the Office of Management and Budget with Standard Industrial Classification (SIC) system number 4493 be covered by a National Pollution Discharge Elimination System (NPDES) permit. Any marina or boat yard that conducts boat maintenance activities, including washing, or that has wastewater discharges must apply for coverage under a permit. In New Jersey, this permit is known as the General Industrial Stormwater Permit. This permit authorizes the discharge of boat and equipment washing water, stormwater runoff from boat maintenance areas, noncontact cooling water, and condensate discharges. In order to comply with the permit, marina operators must develop a stormwater pollution prevention plan and implement best management practices to ensure that wastewater and stormwater leaving the marina property will not harm the quality of the surrounding waters.

How does one apply for the permit?

To obtain coverage, an applicant must submit a Request for Authorization (RFA) form and a USGS quadrangle map that identifies the facility location to the New Jersey Department of the Environmental Protection (NJDEP) along with the required application fee. The fee is $500 and must be paid annually along with submission of the annual recertification form. All necessary forms and instructions can be obtained by calling NJDEP at (609) 633-7021.

The principal requirement of the industrial stormwater general permit is the preparation and implementation of a Stormwater Pollution Prevention Plan (SPPP). The SPPP is an inventory of your facility that identifies potential areas where stormwater may come in contact with contaminants and a plan to remove exposure of stormwater to those contaminants. Implementation of the SPPP will usually include the elimination of stormwater contact with contaminants using simple and cost-effective best management practices such as covering materials with a tarp, building a shed or roof, or designating specific maintenance areas. There is also a requirement for annual inspections to be conducted by the permittee.

Stormwater Pollution Prevention Plan

- The permittee must develop and implement a stormwater pollution prevention plan. The plan must identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with industrial activity at the facility. Additionally, the plan shall describe and insure the implementation of practices to reduce pollutants in stormwater discharges from industrial activities at the facility. Refer to *Box 5* for a general outline.
- For guidance in developing a stormwater pollution prevention plan, contact NJDEP for a copy of the *Stormwater Pollution Prevention Plan Guidance* by calling 609-633-7021. Other resources include: *Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management* Practices and an EPA published summary document on the same subject. Both are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, telephone (703) 487-4600.
- For existing marinas and boatyards, the plan must be completed within six months of obtaining coverage under this permit. The facility must be in compliance with the terms of the plan within 18 months of receiving coverage.
- For new facilities, the plan must be completed and implemented prior to submitting a Request For Authorization for coverage under the general permit.
- Upon request, the plan must be submitted to NJDEP. The permittee may then be notified that the plan does not meet one or more of the minimum requirements. In such an event, the permittee must amend the plan and submit a written certification to NJDEP that the requested changes have been made.
- The permittee shall amend the plan whenever there is a change in design or operation that will have a significant effect on the potential for pollutants to be discharged to State waters. The plan shall also be amended if it proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with industrial activity.

Box 5. Contents of a Stormwater Pollution Prevention Plan

1. Pollution prevention team members
2. Description of other existing environmental management plans (*e.g.*, spill prevention plan)
3. Inventory of source materials processed or stored (*e.g.*, waste oil, fuel, wash water)
4. Inventory of non-stormwater discharges (*e.g.*, process wastewater, domestic sewage)
5. Site map identifying buildings, drainage patterns, waste storage areas, etc.
6. Narrative of existing conditions and controls to minimize exposure to stormwater
7. BMP selection and plan design for:
    A. Washing areas
    B. Blasting, sanding and painting areas
    C. Material storage areas
    D. Engine maintenance and repair areas
    E. Material handling areas
    F. General yard areas
8. Revised site map that identifies and locates selected BMPs
9. Implementation schedule for BMPs and employee training
10. Maintenance Schedule for repairs and improvements
11. Inspection Schedule to ensure proper operation and effectiveness of BMP
12. Annual inspection and annual report that describes facility compliance
13. General Requirements (record keeping and certifications)
14. Administration (important contact information to assist you in preparing a SPPP)

Accidental Discharge of Oil or Hazardous Substances

- γ In the event of an oil spill, the discharger must notify NJDEP at 1-877 WARN DEP, the Coast Guard National Response Center at (800) 424-8802, and the local county health department.
- γ Within 10 days of becoming aware of a release, the permittee must submit a written description of the release.
- γ The stormwater pollution prevention plan required as a condition of the general permit must be modified to include a description of the release and to identify measures to prevent and respond to a recurrence.
- γ Facilities that have more than one anticipated discharge per year of the same hazardous substance or oil, which is caused by events occurring within the scope of the relevant operating system shall, likewise, report the release to NJDEP and identify measures to prevent or minimize such releases. Contact the Bureau of Discharge Prevention Containment and Countermeasures at 609-633-0610.

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Appendices

Appendix I. Information Sources

American Boat and Yacht Council
3069 Solomons Island Road
Edgewater, MD 21037
(410) 956-1050

- Information about holding tank retrofits and vessel standards

Baykeeper
Building 18, Sandy Hook
Highlands, NJ 07732
732-291-0176
www.nynjbaykeeper.org/news.htm

- Oyster recovery program

Boat/U.S. Clean Water Trust
880 S. Pickett Street
Alexandria, VA 22304
(703) 823-9550
(703) 461-2855 (fax)

- Clean boating educational materials

Center for Marine Conservation
1725 DeSales Street, NW
Washington, DC 20036
(202) 429-5609

- Marine debris educational material
- Storm drain stenciling information and materials
- Information about the annual international coastal cleanup

Clean Ocean Action
P.O. Box 505
Highlands, NJ 07732-0505
(732) 872-0111
(732) 872-8041 (fax)
www.cleanoceanaction.org

- Marine educational material
- Storm drain stenciling information and materials
- Hosts the annual New Jersey coastal cleanup

Manasquan Watershed Management Group
c/o Monmouth County Mosquito Commission
P.O. Box 162
Eatontown, NJ 07724
(732) 542-3630
(732) 542-3267 (fax)
www.shore.co.monmouth.nj.us/area12/regional%20councils/manasquan%20regional%20council.htm

- Environmental educational materials
- New Jersey Clean Marina materials
- Watershed management

Marine Trades Association of New Jersey
1999 Route 88E
Suite 11
Brick, NJ 08724-3152
(732) 206-1400
(732) 206-1413 (fax)
www.boatingnj.com/Scripts/JoinMTANJ.asp

- Marine educational materials
- Legislative updates
- Model Stormwater Pollution Prevention Plan available for nominal fee

Maryland Department of Natural Resources
Waterway Resources Division
580 Taylor Avenue
Annapolis, MD 21401
www.dnr.state.md.us/boating/
(410) 260-8770

- Maryland Clean Marina Initiative
- Electronic Copy of marina contract language
- Clean boating tip cards and other educational material
- Copies of ABYC retrofit booklet
- MSD requirement fact sheets

Minnesota Sea Grant College Program
University of Minnesota
St. Paul, MN 55108
(612) 625-1253

- Copy of *Composting Fish Waste* by Thomas Halbach and Dale Baker ($8)

National Fire Protection Association
1 Batterymarch Park
PO Box 9101
Quincy, MA 02269-9109
(800) 344-3555

- Copies of NFPA standards (may be available from your local fire marshal)

New Jersey Marine Sciences Consortium
Building 22, Fort Hancock
Highlands, New Jersey 07732
Phone: (732) 872-1300
Fax: (732) 291-4483
www.njmsc.org/index.htm

- New Jersey Sea Grant
- Marine research and education
- Boat Pumpout program

New Jersey Department of Environmental Protection
PO Box 402
401 East State Street
Trenton, NJ 08625-0402
(609) 777-DEP3 (general information)
1-877-WARN DEP (24-Hour Emergency Hotline)
www.state.nj.us/dep/

Air Quality Permits Program
(609) 633-2829
- Permit for permanent paint spray booth

Education & Outreach
(609) 292-1072
- Environmental education materials & programs

Emergency Response
(609) 633-2168
- Discharge emergency response

Enforcement
(609) 984-4587
- CAFRA, Wetlands, Waterfront Development, Tidelands, & Stream Encroachment

Fish and Wildlife
(609) 292-2965
- Fisheries management

Hazardous Waste Program
- Enforcement (609) 584-4250
- Regulations (609) 633-1418

Land Use Management (609) 292-1932
- Land use permits and technical assistance

Marine Police Stations
- Atlantic City 609-441-3586
- Bivalve 856-785-1330
- Burlington 609-387-1221
- Lake Hopatcong 973-663-3400
- Monmouth Beach 908-229-6000
- Newark Bay 973-578-8173
- North Wildwood 609-522-0393
- Ocean 609-296-5807
- Point Pleasant 732-899-5050

Oil Spills
1-877-WARN DEP

Recycling Office
(609) 984-3438
- General information and recycling coordinators

Rutgers Cooperative Extension
Cook College
State University of New Jersey
88 Lipman Dr.
New Brunswick, NJ 08901-8525
(732) 932-9306
http://www.rce.rutgers.edu/nre/index.html
- Environmental education
- Hard Clam and Aquaculture interest

Appendix II. Permitting Information and Assistance

New Jersey Department of Environmental Protection
Land Use Regulation Program
501 East State Street
2nd Floor
P.O. Box 439
Trenton, NJ 08625-0439

Assistant Commissioner, Raymond Cantor (609) 292-1932
Director, Richard H. Kropp (609) 984-3444

Bureau of Inland Regulation	(609) 633-6563
Bureau of Coastal Regulation	(609) 633-2289
Reception	(609) 292-1235 or 292-0060
Fax	(609) 777-3656 or 292-8115

Call the number below for Land Use Regulation requirements in your county:

(609) 633-6754	(609) 633-9277	(609) 633-6754	(609) 777-0454	(609) 984-0162	(609) 984-0288 or (609) 292-8262
Essex	Morris Bergen	Middlesex Hudson Somerset Union	Hunterdon Mercer Passaic Sussex Warren	Cumberland Camden Salem Gloucester	Atlantic Burlington Cape May Monmouth Ocean

Stream Encroachment Information and Assistance

Stream Encroachment Program
For application assistance call (609) 777-0456
For Tidelands call (609) 292-2573

Call the number below for Stream Encroachment Information in your county:

609-984-0162	609-984-0194
Ocean Camden Monmouth Gloucester Burlington Salem Atlantic Cumberland Cape May	Hunterdon Mercer Middlesex Union Sussex Warren Bergen Passaic Morris Union Essex Hudson

Appendix III. Coastal County Recycling Coordinators

County	Municipality	Coordinator Name and Title	Address	Telephone Numbers
ATLANTIC	County	Brian Lefke County Coordinator	6700 Delliah Rd. Egg Harbor Twp., NJ 08232 08234	(609) 272-6902 (phone) (609) 272-6941 (fax)
BURLINGTON	County	Ann Moore County Coordinator	Burlington Co. Office of SWM P.O. Box 429 Columbus, NJ 08022	(609) 499-1001 (phone) (609) 499-5212 (fax)
CAMDEN	County	Jack Sworaski County Coordinator	Camden Co. DSWM 520 N. Newton Lake Dr. Collingswood, NJ 08107	(856) 858-5241 (phone) (856) 858-5211 (fax)
CAPE MAY	County	Bridgett O'Connor County Coordinator	Cape May MUA P.O. Box 610 Cape May Court House, NJ 08210	(609) 465-9026 (phone) (609) 465-9025 (fax)
CUMBERLAND	County	Dennis DeMatte County Coordinator	2 West Vine St. Millville, NJ 08332	(856) 825-3700 (phone) (856) 691-1374 (fax)
ESSEX	County	Michael Onysko County Coordinator	Essex County 120 Fairview Avenue Cedar Grove, NJ 07009	(973) 857-2350 (phone) (973) 857-9361 (fax)
GLOUCESTER	County	Ken Atkinson County Coordinator	503 Monroeville Rd. Swedesboro, NJ 08085	(856) 478-6045 X14 (phone) (856) 478-4858 (fax)
HUDSON	County	Nicholas Staniewicz County Coordinator	Hudson Co. Improvement Authority 574 Summit Ave., 5th fl. Jersey City, NJ 07306-4000	(201) 795-4555 (phone) (201) 795-0240 (fax)
MIDDLESEX	County	Jim Lentino County Coordinator	96 Bayard St., 2nd fl. New Brunswick, NJ 08901	(732) 745-4170 (phone) (732) 745-3010 (fax)
MONMOUTH	County	Fran Metzger County Coordinator	Hall of Records 1 E. Main St. Freehold, NJ 07728	(732) 431-7460 (phone) (732) 431-7795 (fax)
OCEAN	County	John Haas County Coordinator	129 Hooper Ave. Toms River, NJ 08754-2191	(732) 506-5047 (phone) (732) 244-8396 (fax)
SALEM	County	Melinda Williams County Coordinator	Salem Co. UA P.O.Box 890, 52 McKillip Rd. Alloway, NJ 08001-0890	(856) 935-7900x15 (phone) (856) 935-7331 (fax)
SOMERSET	County	Roseann Brown County Coordinator	Somerset Co. Office of SWM P.O. Box 3000 Somerville, NJ 08876	(908) 231-7109 (phone) (908) 575-3951 (fax)

Note: Municipal Coordinators can be found on the NJDEP website at www.state.nj.us/dep/dshw/recycle/index.htm

Appendix IV. Used Oil Recycling Facilities (Authorized "Class D")

COUNTY	FACILITY NAME	ID #	EPA #	PHONE
Camden	**Clean Venture, Inc**. (formerly RemTech)	0408001464	NJD 980 536 577	(609) 365-5544
Cumberland	**Casie Ecology Oil Salvage**	0614001445	NJD 045 995 693	(609) 696-4401
Gloucester	**Republic Environmental Recycling, Inc.**	0801001477	NJD 981 133 150	(609) 881-7400
Gloucester	**Prickett's Industrial Tank Cleaning Corp. (PITTCO)**	0802001444	NJD 071 454 276	(856) 228-1071
Middlesex	**Lionetti Oil Recovery Company, Inc.**	1209F1		(732) 721-0900
Middlesex	**Marisol, Inc.**	1211001461	NJD 002 454 544	(732) 469-5100
Salem	**Monarch Environmental, Inc**. (formerly CR Warner, Inc.)	1709001436	NJD 011 881 174	(609) 769-9022
Union	**LORCO Petoleum Services**	2004001424	NJR 000 023 036	(908) 352-0542

Appendix V. Sample Contract Language

The following text is based on the Marine Trades Association of New Jersey's *Best Management Pledge*. The language may be incorporated into lease agreements. Visit the Manasquan Watershed Management Group's website for an electronic copy.

FOR TENANTS:

I, _____ (name), understand that _____ (marina/boatyard)

subscribes to and enforces pollution prevention procedures. I further understand and agree that in return for the privilege of performing work on a boat at this facility such as hull cleaning, washing, sanding, polishing and /or painting; bottom cleaning, sanding, scraping, and/or painting; opening the hull for any reason, *e.g.,* installation of equipment or engine work; engine and/or stern drive maintenance, repair, painting; etc., it is my responsibility to comply with, at a minimum, the following pollution prevention practices. I understand that this list may not be complete and pledge that I will exercise common sense and judgment in my actions to ensure that my activities will not deposit pollution residues in surface waters or elsewhere where they may be conveyed by stormwater runoff into the surface waters. I understand that failure to adopt pollution prevention procedures may result in expulsion from the marina/boatyard (*insert name of facility*) and forfeiture of rental fees. I understand that I may elect to employ the facility to perform potential pollution producing activities on my behalf in which case the responsibility for compliance with the best management practices is entirely theirs.

Signed _____ Date _____

FOR SUB-CONTRACTORS ONLY:

I understand and agree to have my proposed work first authorized by this facility and that I will adhere, at a minimum, to the contents of this document. I further understand that because of the nature of my proposed work, the facility may require that I be supervised by an employee of said facility for which, I will pay the normal existing labor rate.

Signed _____ Date _____

POLLUTION PREVENTION PRACTICES:

A. REPAIRS AND SERVICE (to hull and engine: painting, cleaning, washing, sanding, scraping, etc.)

1. Work on hulls and engines only in designated areas or use portable containment enclosures with approval of marina management.
2. Use tarps and vacuums to collect solid wastes produced by cleaning and repair operations-especially boat bottom cleaning, sanding, scraping, and painting.
3. Conduct all spray painting within an enclosed booth or under tarps.
4. Use non-toxic, biodegradable solvents.
5. Capture debris from boat washing and use only minimal amounts of phosphate-free, non-toxic, and biodegradable cleaners.
6. Use drip pans for any oil transfers, grease operations, and when servicing I/Os and outboard motors.
7. Obtain management approval before and after repairs that open the hull.
8. Use spill proof oil change equipment.

B. VESSEL MAINTENANCE WASTE

1. Non-toxic residue of sanding, scraping, and grinding: bag and dispose of in regular trash.
2. Toxic and non-environmentally safe solvents and cleaning liquids: seek specific directions from marina management or dispose of with licensed agency.

C. FUEL OPERATIONS

1. Install fuel/air separator on fuel tank vent line(s) to prevent overflow of fuel through vent.
2. Keep petroleum absorbent pad(s) readily available to catch or contain minor spills and drips during fueling.

D. WASTE OIL AND FUEL

1. Recycle used oil and antifreeze.
2. Add a stabilizer to fuel tank in the fall or an octane booster to stale fuel in the spring. Use the fuel or bring it to a household hazardous waste collection site.
3. Absorbent materials soaked with oil or diesel: drain liquid and dispose of in used oil recycling container; double bag absorbent material in plastic and dispose in regular trash receptacle.
4. Absorbent materials soaked with gasoline (flammable): air dry and reuse.
5. Bioremediating absorbent products: dispose in regular trash as long as no liquid is dripping. Because the microbes need oxygen to function, do not seal in plastic.
6. Oil filters: drain and recycle the oil; recycle the filter or double bag and put in regular trash.

E. ONBOARD PRACTICES

1. Maintain oil absorbent pads in bilge. Inspect no less than annually.
2. Do not discharge bilge water if there is a sheen to it.
3. Use only low-toxic antifreeze (propylene glycol). Recycle used antifreeze (even low-toxic antifreeze will contain heavy metals once it has been used.)

F. SEWAGE HANDLING

1. Never discharge raw sewage within New Jersey waters.
2. If you have an installed toilet, you must have an approved Marine Sanitation Device (MSD).
3. Do not discharge Type I or Type II marine sanitation devices within the marina basin.
4. Use marina restroom facilities when at slip.
5. Do not empty port-a-pots overboard; use marina dump facility. Do not empty port-a-pots in the restrooms.
6. Do not discharge holding tanks overboard; use pumpout facility.
7. If you must use a holding tank additive, use an enzyme-based product. Avoid products that contain quaternary ammonium compounds (QACs), formaldehyde, formalin, phenal derivatives, alcohol bases, or chlorine bleach.
8. Liveaboards, place a dye tablet in holding tank after each pumpout. The dye will make any illegal discharges clearly visible.

G. ORGANIC WASTE

1. Clean fish only in designated areas.
2. Grind, compost, or double bag fish scraps (*depending on the services offered by your marina)*.
3. Walk pets in specified areas and dispose of their wastes, double-bagged, in the dumpster.

H. SOLID WASTE

1. Recycle plastic, glass, aluminum, newspaper, and used lead batteries *(tailor this section to fit your facility's practices).*
2. Place trash in covered trash receptacles; replace covers.

Appendix VI. Conservation Landscaping

Conservation landscaping works with nature to reduce pollution and enhance wildlife habitat. It encourages a low input formula for yard care: less fertilizers and pesticides, proper lawn care and alternatives to turf. Wise management of soil, water and vegetation are the key to conservation landscaping. This includes maintaining a healthy vegetative cover, preventing soil erosion from wind and water, and maintaining proper soil pH and fertility levels.

Water conservation is a vital element to conservation landscaping. Excess or wasted water runs off the land carrying nutrients, sediments and even traces of toxic products into nearby rivers and streams. Protection of local waterways depends upon reduced water runoff. You can reduce the amount of water used to maintain your yard, by as much as two-thirds, with little expense or effort. Some key elements include timing and thoroughness of watering, proper equipment and plant selection.

Diversity in the landscape provides for the needs of people and wildlife. No matter how large or small an area, you can create diversity by utilizing different types of plants. Native grasses, ground covers, wildflowers, shrubs and trees provide a variety of shapes, colors, smells and habitats. Even very small or urban yards can be transformed into a natural landscape that protects water quality and provides important habitat.

Master Gardeners

Master Gardeners of Rutgers Cooperative Extension are a group of trained volunteers who provide horticultural programs and services to enhance their communities. Master Gardeners are enthusiastic, willing to share ideas, and offer assistance to those interested in beneficial landscaping.

Rutgers Cooperative Extension has Master Gardener programs in the following counties:

- Bergen County
- Camden County
- Essex County
- Gloucester County
- Hunterdon County
- Mercer County
- Middlesex County
- Monmouth County
- Ocean County
- Passaic County
- Somerset County
- Sussex County
- Union County

Contact your County Extension Office for more information about the Master Gardeners program in your county.

Native Wildflowers and Grasses of the Northeastern U.S.

The following information was compiled by the U.S. Fish and Wildlife Service, Chesapeake Bay Field Office, 177 Admiral Cochrane Drive, Annapolis, MD 21401, (410) 573-4593. States included in the Northeastern region of the U.S. include: KY, WV, OH, VA, DC, MD, DE, PA, NJ, NY, RI, CT, MA, VT, NH, ME.

Moisture	**Soil**	**Sun**
Dry, Average, Wet	Sand, Loam, Clay	Full Sun, Partial Sun, Shade

Latin Name	Common Name	Ann. Per.	Color	Ht	Blooms	D	A	W	S	L	C	F	P	S
Wildflowers														
Aquilegia canadensis	Eastern Columbine	P	Scarlet	1-2'	Mar-May	•	•			•	•	•	•	•
Asclepias incarnata	Swamp Milkweed	P	Pink	3-5'	Jun-Aug		•	•	•	•	•	•	•	
Asclepias tuberosa	Butterfly Milkweed	P	Orange	2-3'	Jun-Aug	•			•	•		•		
Aster laevis	Smooth Aster	P	Violet	2-4'	Aug-Oct	•	•		•	•		•		
Aster novae-angliae	New England Aster	P	Purple	2-6'	Aug-Oct	•	•		•	•	•	•	•	
Caltha palustris	Marsh Marigold	P	Yellow	1-2'	Apr-May		•	•	•	•		•	•	
Chelone glabra	White Turtlehead	P	White	2-4'	Aug-Sep			•	•	•		•	•	
Coreopsis tinctoria	Tickseed Sunflower	A	Yellow	1-3'	Jun-Sep	•			•	•		•	•	
Coreopsis verticillata	Moonbeam Coreopsis	P	Yellow	1-2'	Jun-Oct	•	•		•	•		•		
Eupatorium dubium	Joe Pye Weed	P	Purple	4-7'	Jul-Sep		•	•		•	•	•	•	
Eupatorium perfoliatum	Boneset	P	White	3-4'	Jul-Aug		•	•	•	•	•	•		
Eupatorium purpureum	Joe Pye Weed	P	Pink	2-6'	Jul-Sep		•			•		•	•	
Geranium maculatum	Wild Geranium	P	Pin-Pur	1-2'	Apr-Jul	•	•		•	•		•	•	•
Iris versicolor	Blue Flag Iris	P	Purple	2-3'	Jun-Jul			•	•	•		•		
Liatris spicata	Blazingstar	P	Purple	2-5'	Jun-Sep	•	•		•	•		•	•	
Lobelia cardinalis	Cardinal Flower	P	Red	2-5'	Jul-Sep		•	•	•	•		•	•	
Lupinus perennis	Lupine	P	Blue	1-2'	May-Jun	•	•		•			•	•	
Monarda didyma	Bee Balm	P	Scarlet	2-4'	Jun-Jul	•	•	•		•	•	•	•	
Monarda fistulosa	Wild Bergamot	P	Lavender	2-5'	Jun-Jul	•	•		•	•	•	•	•	•
Oenothera perennis	Sundrops	P	Yellow	1-3'	May-Aug	•			•			•		
Opuntia humifusa	Prickly Pear Cactus	P	Yellow	1'	Jun-Jul	•	•		•	•		•	•	
Penstemon digitalis	Smooth Penstemon	P	White	2-3'	Jun-Jul	•	•		•	•	•	•	•	
Penstemon leavigatus	Beardtongue	P	White	1-2'	May-Jun		•			•			•	•
Phlox divaricata	Blue Phlox	P	Blue	.5-1'	Apr-May		•			•			•	•
Phlox subulata	Moss Pink	P	Pin-Wht	.5-1'	Apr-May	•	•		•	•	•	•	•	
Rudbeckia fulgida	Black Eyed Susan	P	Yellow	1-3'	Jul-Sep	•	•		•	•	•	•	•	
Solidago rigida	Rigid Goldenrod	P	Yellow	3-5'	Aug-Oct	•	•		•	•		•		
Solidago rugosa	Rough Goldenrod	P	Yellow	3-5'	Aug-Oct		•	•	•	•		•	•	
Vernonia noveboracensis	New York Ironweed	P	Purple	5-8'	Aug-Sep		•	•		•	•	•	•	
Viola pedata	Birds Foot Violet	P	Purple	1'	Mar-Jun	•			•	•		•		

						Moisture Dry, Average, Wet			Soil Sand, Loam, Clay			Sun Full Sun, Partial Sun, Shade		
Grasses	**Common Name**	**Ann. Per.**	**Color**	**Ht**	**Blooms**	**D**	**A**	**W**	**S**	**L**	**C**	**F**	**P**	**S**
Andropogon gerardi	Big Bluestem	P	see note	3-8'		•	•	•	•	•	•	•	•	
Andropogon virginicus	Broomsedge	P		1-3'		•	•		•	•	•	•	•	
Elymus canadensis	Canada Wild Rye	P				•	•		•	•	•	•	•	
Panicum virgatum	Switchgrass	P		3-6'			•	•	•	•	•	•		
Schizachyrium scoparium	Little Bluestem	P		4'		•	•		•	•		•	•	
Sorghastrum nutans	Indiangrass	P		5-7		•	•		•	•		•	•	

Note: The grasses are various shades of greens, blues, goldens, coppers during different times of the year. This list was developed from several sources and represents only a partial list of species. Most species were selected because of their availability from some seed companies. Most plants are also available in pots.

Sampling of Other Native Plants

	Name	Height	Features
Evergreen Trees	American Holly, *llex opaca*	45’	Red berry; wildlife value; needs moist, acid soil
	Eastern Red Cedar, *Juniperus virginiana*	80’	Pyramidal; wildlife value; thick branches, dense foliage; tolerates poor soils
	Canadian Hemlock, *Tsuga canadensis*	90’	Pyramidal; dense habitat; wildlife value; prefers rich, moist soil
Deciduous Trees	Shagbark Hickory, *Carya ovata*	60’ – 80’	Oval; narrow habitat; nuts; wildlife value; needs deep, rich soil and sun
	White Oak, *Quercus alba*	60’ – 90’	Round-headed, largest of oaks; wildlife value; tolerates range of soils
	Sourwood, Sorrel Tree, *Oxydendron arboreum*	40’ – 60’	Pyramidal; flowers in July, glossy foliage, striking fall color
Evergreen Shrubs	Inkberry, *llex glabra*	3’ – 15’	Globular; nectar for bees, open habit, small leaf, black berry; tolerates sandy, peaty, acid soils
	Bayberry, *Myrica pensylvanica*	4’ – 8’	Persistent leaves; aromatic; wildlife value; tolerates dry, sandy soils
	Wax Myrtle, *Myrica cerifera*	25’ – 30’	Persistent leaves; wildlife value, grayish-waxy fruit, inconspicuous flowers
Deciduous Shrubs	Red Chokeberry, *Aronia arbutifolia*	9’	Flowers May-June, smooth pale leaves, red berry; wildlife value; tolerates wet acid or dry soil
	Sweet Pepperbush, *Clethra alnifolia*	6’	Oval; fragrant flower July-Aug, persistent brown seed; wildlife value; tolerates acid wet or dry soil and some shade
	Flame Azalea, *Rhododendron calendulaceum*	9’	Oval; May-June flower; tolerates dry, acid soil and light shade
Ground Covers	Violet Wood Sorrel, *Oxalis violacea*	4” – 8”	Excellent for rock gardens; tolerates some shade, dry soil, and drought
	Blazing Star, *Liatrus spicata*	1” – 3”	Rose-purple flowers, late summer bloom, hairy stem
	Bird-Foot Violet	2” – 6”	Purple flowers; tolerates some shade, dry soil, and drought

Some Native Plant Nurseries

The following list identifies Nurseries that sell native plants. This list was prepared by:
Native Plant Society of New Jersey, Inc., Cook College, 102 Ryders Lane, New Brunswick, NJ 08901-8519.

RETAIL NURSERIES

Bowmans Hill Wildflower Preserve
No mail orders-Herbaceous & Woody Plants
PO Box 685
New Hope, PA 18938
(215) 862-2924
http://www.bhwp.org
email: bhwp@bhwp.org

The Cummins Garden
$2.00 catalog - Woody Plants
22 Robertsville Road
Marlboro, NJ 07746
(908) 536-2591

Fancy Fronds
$2.00 catalog - Hardy Ferns
PO Box 1090
Gold Bar,WA 98251
(360) 793-1472
http://www.fancyfronds.com

Fairweather Gardens
$2.00 catalog
Woody Plants (mail order only)
PO Box 330
Greenwich, NJ 08323
(609) 451-6261

Flora for Fauna Nursery
Free catalog
Herbaceous & Woody Plants
RR3 Box 438 Friedreichstadt Ave.
Woodbine, NJ
(609) 861-5102

Foliage Gardens
$2.00 catalog - Hardy Ferns
2003 128th Avenue S.E.
Bellevue, WA 98005
(206) 747-2998

Native Gardens
$2.00 catalog
Herbaceous & Woody Plants
Route 1, Box 494
Greenback, TN 37742
(615) 956-3350

Niche Gardens
$3.00 catalog
Herbaceous & Woody Plants
1111 Dawson Road
Chapel Hill, NC 27516
(919) 967-0078

Sunlit Gardens
$3.00 catalog
Herbaceous & Woody Plants
174 Golden Lane
Andersonville, TN 37705
(423) 494-8237
e-mail: sungardens@aol.com

Toadshade Wildflower Farm
Free catalog
Herbaceous Plants
53 Everittstown Road
Frenchtown, NJ 08825
(908) 996-6658
http://www.toadshade.com
e-mail: toadshade@toadshade.com

Virginia Natives
$2.00 catalog
Herbaceous & Woody Plants
PO Box D
Hume, VA 22639
(540) 364-1665

WE-DU Nurseries
$2.00 catalog
Herbaceous & Woody Plants
Route 5, Box 724
Marion, NC 28752
(704) 738-8300

Wild Earth Native Plant Nursery
$2.00 catalog
Herbaceous & Woody Plants
PO Box 7258
Freehold, NJ 07728
908 308-9777 (Nursery is in Jackson, NJ)
e-mail: wildearthnpn@compuserve.com

Woodlanders
$2.00 catalog
Herbaceous & Woody Plants
1128 Colleton Avenue
Aiken, SC 29801
(803) 648-7522

WHOLESALE ONLY

Arrowwood Nursery
$3.00 catalog
Herbaceous & Woody Plants
870 W. Malaga Road , Route 659
Williamstown, NJ 08094
(609) 697-6044

Pinelands Nursery
$3.00 catalog
Herbaceous & Woody Plants
323 Island Road
Columbus, NJ 08022
(609) 291-948